SUPPLEMENT.

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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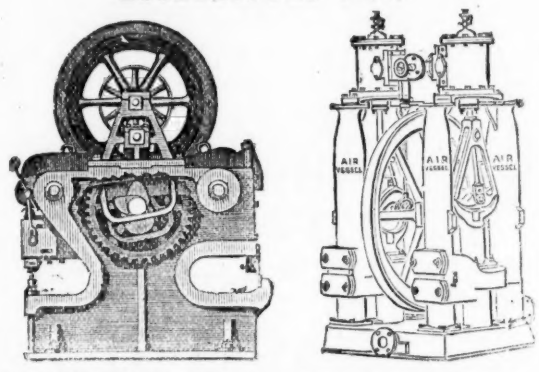

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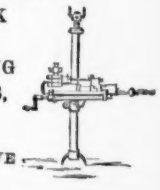

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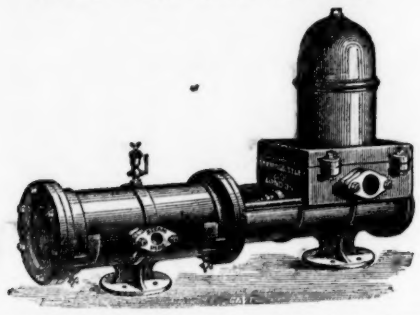

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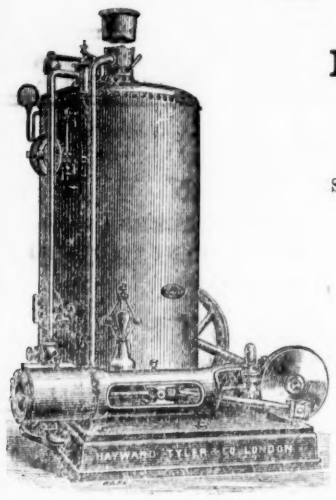

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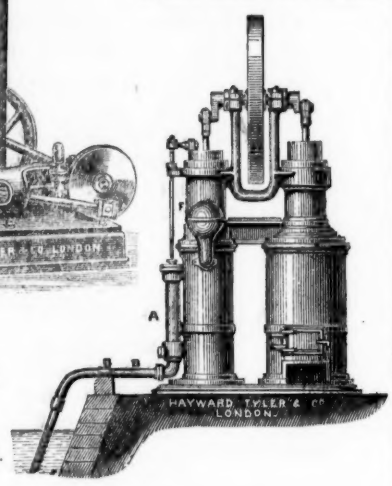

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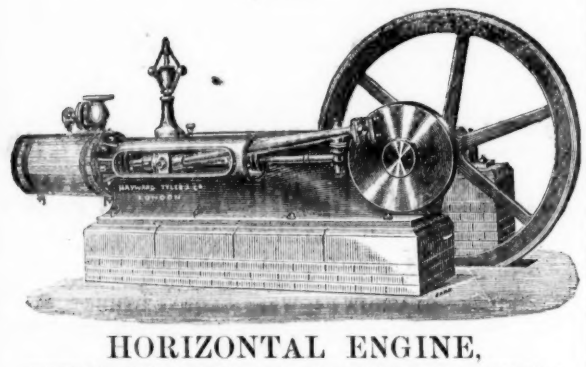

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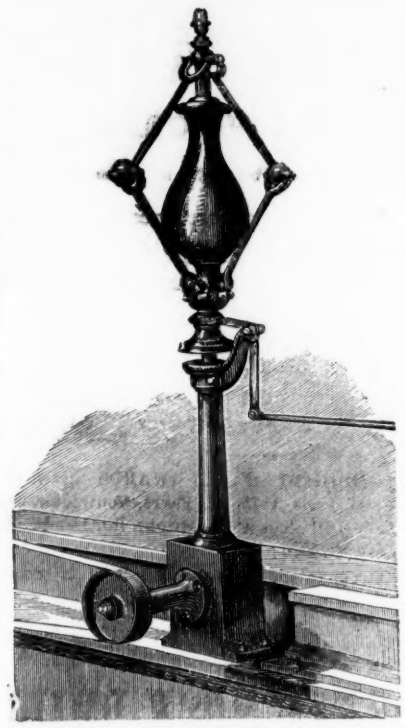

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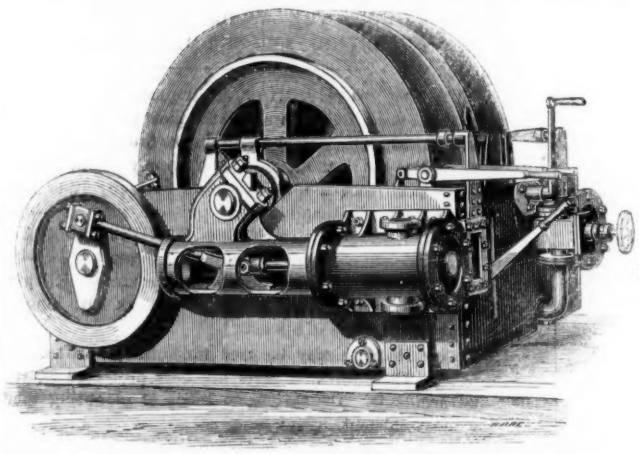

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MINING IN SOUTH ARIZONA.

SIR,—It sometimes happens that an incidental remark conveys far more information than a direct statement, and this is very often the case in reports relating to mining concerns, because there is such a tendency on the part of mine reporters to exaggerate. It is only last week that I read the statement that a South Arizona mine had shipped 3 tons of ore, worth $20,000 per ton, or more. Now, putting it at only the lowest figures, we get $60,000 for the parcel, and it would not be unreasonable to calculate that at least 3 tons per week could be got, for this reason. The property being in a district only inhabited by savages, one could not suppose dressing floors and facilities of that sort for making the ore marketable to exist. Miners know that it costs no more to break $20,000 mineral than mineral yielding but $20 per ton, but charge $10,000 for the breaking and getting the 3 tons to market. Call it $50,000 per week profit, and we ought to be under the mark. This just makes, working 50 weeks a year, $2,500,000 profit annually, which is a profit one would have thought sufficient to enable the owners—with the aid of a good president, treasurer, and secretary—to raise the capital wanted in San Francisco, Boston, or New York. Why, with a capital of 1,000,000*l.*, which is just the amount paid for the Emma, this $2,500,000 would represent just 50 per cent. per annum profit for the shareholders. What unpatriotic fellows the owners must be to let such a concern slide out of the country!

But then there are the incidentals. The properties "have been held by the present owners for the last three years under all the difficulties and dangers incident to the country from hostile Indians, and the owners now place them in" the Toltec Syndicate of Mines. Now, if it has taken three years to raise the 3 tons, the vendors' desire to sell is less remarkable, and the above calculation of 50 per cent. per annum profit on 1,000,000*l.* capital for the shareholders will, I suppose, have to be corrected. Knowing something of the region, I believe that more than 1 ton a year can be got out of many mines that can be had for the mere locating, but I do not know that the hostile Indians are much less troublesome now than they have been for many months past, so that if $20,000 mineral be obtainable in quantities to make the properties worth the attention of English capitalists there is no proper reason why the concern should not long since have been rendered independent of outside capital by applying part of the returns for buying machinery and for working capital.

I am not an American citizen, but I know enough of America and its affairs to be able to assert, without fear of contradiction, that there is an abundance of capital in that country for all legitimate enterprise. I know, too, that no American mining enterprise of more than very shadowy promise (that is at the time of sale) has been offered by Americans in England; and that in entering upon speculative properties European and especially home properties are preferable to American, because more easily within reach, and more readily controlled.—*Reform Club, July* 29. C. B.

MINING IN NEW MEXICO—No. III.

SIR,—Before proceeding with this season's report permit me to correct the statement as $5 being the average assay value of the ore of the Montezuma Gold Mine, so as *not* to let the owners attribute the failure of their English correspondents to accomplish the purchase to be attributed to this misprint. The average assay really is $75 per ton of ore, as stated in the United States' reports, and by me on other occasions. The great and all-exciting news of the northern part of this territory is the actual construction of the Atchison, Topeka, Santa Fe Railway prolongation within the limits of the territory. South of the Baldy Mountain no new discoveries have been made since my report in 1876 but those of large deposits of mica near the town of Mora. This and other discoveries of the same mineral have already had the effect that the few houses controlling the mica trade on this continent, though buying themselves at very low prices, can scarcely keep up anything like the old prices. What sheets (books) of 3 in. × 5 in. were sold at a few years ago those of 10 in. × 16 in. can now be had at the mines, if ordered in quantity. Manufacturers of ornamental articles, stationers, and photographers will do well to take this change into consideration, as it will enable them to apply this beautiful mineral to a larger extent than before. The New Mexico mica may be split so finely into clear unclouded sheets, making proper selection, that such sheets fastened with a thin coat of varnish to the face of a photographic, painted, or printed image will not only have the appearance but the flexibility also of mere varnish, and the images will be protected by a hard mineral sheet resisting alike atmospheric action and alcoholic solutions, turpentine, &c., completely. Further south, in the Cerillos Mountains, one of the argentiferous lead mines has been the object of operation on a small scale, but partly on account of the thorough demoralisation of the lead market it is likely to become worse instead of recovering, and the recent discovery of enormous deposits of carbonate of lead in California Gulch, Colorado (Leadville, a newly-built town there a few months old), and partly on account of poverty and utter incompetency of the men connected with the new enterprise the attempt has proved a total failure.

In my next I will furnish some more about the copper-producing facilities of this territory. F. M. F. CAZIN,
Bernalillo, New Mexico, July 6. Mining and Civil Engineer.

MINING IN NORTHERN MEXICO.

SIR,—In the northern part of Mexico the mineral wealth is very little known, and almost, with the exception of some half-a-dozen mines in each State, entirely unexplored. In the States of Sonora, Chihuahua, Sinaloa, and Durango there are thousands of well-defined lodes, and many of them exceedingly rich. I would like, through the Journal, to make some brief notes on some of the districts in these States as well as the extent to which mining is carried on to-day.

SONORA.—In this State mining has been dull for some years owing to incessant political disturbances. The unpopular governor has, however, retired, and there is every prospect of prosperity. Among some of the most promising mines are La Barranca, San Antonio, and Las Animas, situated near the Upper Yaqui river. La Barranca was started by the officers of an American company who worked some years at San Marcial. The mine of San Marcial yielded over $1,000,000 of silver in a short time, but, owing to the most extravagant and reckless working, came to grief. The officers who had saved some little money started to work the Barranca Mine with a capital, as one of them told me, of $9000. For the past two years this mine has been sending to the Hermosille Mint between $30,000 and $40,000 monthly. Of course this is an exceptional instance, and I mention it only to show that with careful investigation mining in this country is one of the most profitable businesses at present before the public.

In the Sahnaripa district are the Los Prietos, and one of the most important mines of the State—La Trinidad. This mine (La Trinidad) is situated ten leagues from the border of the State of Chihuahua, and some seven days journey from the port of Guaymas. It possesses a large and commodious hacienda, with ample machinery; most of the machinery was erected under the administration of the late much esteemed and respected Mr. J. P. Clemes, of Cornwall. The manner of beneficiating the ores is by the lixiviation process, precipitating the silver as sulphide of silver by the agency of sulphide of calcium. This process, which is a modification of the Von Patera process, has superseded the Patio process in all mines having rebellious ores. A gentleman, manager of a large mining company in Lower California, has told me that after careful calculation he finds he saves $10,000 on every $60,000. He states that all the plant necessary for the beneficio can be made on the spot, and thus avoid the expense of pans and mercury. When we take into consideration that all machinery has to be carried on mules from the place of landing to its destination, and the great facility with which all kinds of timber may be procured on the mines, it will be seen that although his estimate is a large one yet there is every reason to accept its veracity.

There are several other districts, and very important ones too, among which I may mention that of Alamos, which has many mines. But, with your permission, I purpose devoting another letter specially to the Alamos Mines. I may say that to-day there is every prospect of more peaceable times in Mexico. The Government seems to be popular, and all the States are clamouring for railways, several of which are commenced. MINERO.
Alamos, Sonora, June 10. ——

THE RICHMOND MINING COMPANY.

SIR,—Whatever may be Mr. Elliott's intention in regard to the letter with which we were jointly favoured by Mr. John Bayliss, in the Supplement to last week's Journal, I have for myself determined to close a correspondence which originated, so far as I am concerned, in the interests of the shareholders, but has now assumed the character of a personal controversy between Mr. Bayliss and myself, of little general interest, and in Mr. Bayliss's present frame of mind I fear of little use. If I appear to deny him now the gratification of further interrogating me, and of imparting to me motives and conduct which I entirely disclaim, he may be quite assured we shall have other opportunities of exchanging ideas in regard to the Richmond Company and the report of the committee of investigation.

I beg, Sir, to thank you for your impartiality and for the space you have so liberally afforded me in your columns.
Bolton Gardens, Aug. 1. —— J. P. BRIDGWATER.

THE ENGLISH LEAD TRADE.

SIR,—Further consideration of the subject noticed in my last communication naturally leads one to examine details relating to many of the most successful of British lead mines, as well as to those of some that have not so well fulfilled the hopes and expectations of proprietors, in order to see if there be any rule or law which should guide ordinary investors in their selection of districts possessing more or less certainty of success than others; and it is curious to find on research that of two counties, both of which have yielded very large quantities of ore during the past twenty-three years, the one which can boast of having within its boundary the celebrated Van Mine does not, in the statistics published by authority [Hunt's Statistics], exhibit nearly so large a product for the period named as that of the adjoining county: the quantities of lead ore raised since 1855 are given in round numbers as 100,000 tons for Montgomeryshire, in which the Van is situate, against 176,000 tons for Cardiganshire. It may not unreasonably be objected that as the mine named has sold ores for only some fourteen years out of the entire number mentioned, this discrepancy is not in reality so great; but reference to the publication quoted from shows that for the earlier portion of the time named, and for many subsequent years also, Montgomery was, of course, credited with the enormous returns obtained from such famous mines as Dyliffe, Dyfngwm, Llanerchyraur, &c.; also that the quantities of lead ore raised and smelted during the ten years ending in 1857 were for Montgomeryshire 15,166 tons; for Cardiganshire 68,885 tons!

As will doubtless be generally surmised, a large portion of the ore return for Cardiganshire has been contributed by the Lisburne Mines, situate in the centre of a metalliferous district, the character and importance of which, taken in relation to the lead trade of the country, should not be underestimated, as that portion of the range of mines already worked upon has proved the richest and most profitable of any in the Principality hitherto discovered; at the same time, it should be remembered that, compared with the known extent of mineral riches the locality possesses, only a very small share of the treasures have yet been taken away. So far as the Lisburne Mines are themselves to be considered, there is reason to believe that although the shareholders have received such ample dividends upon their original investment, yet that so profitable has been their career that they have in addition, and out of what may be termed revenue, defrayed expenses of development and machinery to an amount, in the aggregate, little short of the sum to be divided amongst themselves. It is, however, probable that from efflux of time many of the earlier members of this flourishing enterprise have either themselves passed away, or from circumstances have ceased to devote the energy and activity that formerly distinguished the administration of its affairs, and therefore we shall be prepared to find that the well ascertained mineral wealth of the locality will ere long have attracted attention from additional seekers for lucrative investment. Some idea of the magnitude of the operations and profits made in connection with the Lisburne Mining Company is shown by the amount paid as dividends—each share upon which 18*l.* 15s. has been called up has received no less a sum than 586*l.* 10s.; or in other words, the profits so divided represent a total sum approaching half a million sterling, and the actual paid up capital by which such marvellous results have been obtained appears to have been only 7500*l.*! But, as before stated, a large expenditure on account of works and plant has been taken out of additional revenue or profit.

There remain many features of interest to which I should like to allude before closing my notice of Cardiganshire Mines; and as they would probably encroach too much upon your space now, I defer them for a future communication. JOHN OWEN.
Bishopsgate street Within, Aug. 2.

MINERAL CORPORATION OF GREAT BRITAIN.

SIR,—I am requested to give the most emphatic contradiction to the statement made last week by Messrs. Watson Brothers in their Circular (which appears in your columns) that the Mineral Corporation of Great Britain "tried to get" Capt. Roberts as the superintendent of their mines. Capt. Roberts, on April 24 last, applied for the appointment, and again on June 19 for it, in conjunction with his brother. The services of both were declined.
Finch-lane, July 29. —— H. E. VICKERS, Secretary.

THE MINERAL CORPORATION OF GREAT BRITAIN—HAFNA MINE.

SIR,—I must ask you to allow me to correct some mistakes made by Messrs. Watson Brothers in their remarks on page 817 of last Saturday's Journal. In referring to D'Eresby Mountain and Hafna Messrs. Watson state—"There is another east and west lode, which crosses all the north and south lodes in the valley at D'Eresby Mountain. This runs 200 fathoms through D'Eresby Mountain, passes through the adjoining sett of Trefriw for 300 fathoms, and then enters Hafna. A coloured map, showing the direction and number of the lodes, may be had, as we have said before," &c. It is true the above-named lode crosses the Gorse lode in the valley, but it then enters Rhuadyrwst sett, which sett has the lode for 300 fms. in length; it then goes through the Hafna Mine for half a mile in length, and then enters High Hafna. It does not enter the Trefriw Mine at all, as represented by the plan Messrs. Watson refer to; in fact, it runs in quite another direction to that shown on the plan, which is altogether wrong. With reference to the Hafna lode in No. 4 adit level in D'Eresby Mountain Mine I beg to say the tramroad in that level was laid down for the express purpose of working the Hafna lode. —— WILLIAM BENNETTS.

PANDORA MINING COMPANY.

SIR,—I, and doubtless all other shareholders in Pandora, have received a letter from Mr. Crofts, of Finch-lane, asking us to join him in a course of action antagonistic to the present directorate. Pandora has every prospect of early success, occupying a splendid position in a most promising district; but it wants money for proper development. Of all this the company represented by Mr. Crofts are well aware, and would gladly include Pandora in the range of their very extensive projected operations, with a new manager, new directors, and a new London office; hence Mr. Croft's letter. But with all these we are already supplied, and in my belief well supplied; and, therefore, unless very much better arguments are brought forward than have been yet, to change would be a hazardous thing, and I should say to my fellow-shareholders, as does Mr. Punch in his advice to those about to marry, "don't." I believe the money required is being rapidly raised; I have myself contributed, as I prefer a known present to an unknown future, and I trust the men we have. I do not at all like these tactics of the Mineral Corporation; they do not appear to me remarkably ingenious. I may not be able to see very far into a millstone, but I am nevertheless— NOT ALTOGETHER BLIND.

THE ASSHETON MINES.

SIR,—My attention has been called to a report appearing in last week's Journal, written by Capt. George Rickard, on the Assheton Mine, in which he remarks that No. 1 pitch over the 20, south of Mawr shaft, has recently been lost, for an explanation of which he refers us (shareholders, I suppose) to his letter accompanying the report. As I and several other outside shareholders take a good deal of interest in the welfare of the mine, perhaps Capt. Rickard would kindly favour us with the explanation contained in his letter relative to the report through the medium of your valuable Journal as early as convenient. I also notice a remark in the same report that they are stacking ore pretty largely. I understand that Capt. Rickard sampled 60 tons of lead on or about the 12th inst. Will he kindly explain why he has only about 40 tons of such parcel in the bin on the 30th inst. Is this stacking ore, or what is it?
July 31. —— A SHAREHOLDER.

ROCK-BORING MACHINERY—SCHRAM'S CLAIMS.

SIR,—The writer "Alpha" in a late number of the Journal accords to Mr. Crease only bare justice in assigning to him the invention of the so-called Schram boring machine. On October 14, 1863, and July 2, 1867, Mr. Crease illustrated and described in his specifications the general arrangement of ports and passages for actuating the main piston and slide-valve piston claimed by Schram in his specification dated Jan. 11, 1876. The Schram ore-compressor direct-acting was made in England nearly 30 years ago, and somewhat extensively employed as an exhaust-pump at Millwall. The Schram carriage support was used in South Wales in 1873 or 1874, and is radically illustrated in Zwick's work on tunnelling, page 138. The Schram shaft sinking support was introduced by Darlington some four or five years ago. Some of the illustrations in Mr. Schram's loosely-printed pamphlet are to be found in a tract by Mahler, of Vienna, issued in 1876. Indeed, between these two gentlemen there would seem to be some understanding to praise, and promote each others interest.

It would seem as if Mr. Schram regarded the inventions of others as "unconsidered trifles"—to be stamped as inventions of the highest merit only when branded with his euphonious name. We may, however, join in styling Schram's drill a "remarkable one."—1. The piston will and must frequently strike the back cover and front gland, particularly if the pressure fluid should be high—a trick disagreeably bad and dangerous.—2. The air is not worked expansively, consequently the consumption of compressed air must be at least the cubic contents of a stroke multiplied by the number of strokes made per minute. Its "remarkably small consumption of air or steam" is therefore a bare assertion, and not a bare fact.—3. The blow is obtained when there is no pressure whatever on the back of the piston, and when the full pressure is on the front of the piston to withdraw the tool. The result is, in spite of Mr. Schram's assertion, a "'twixt wind and water blow"—a feeble, vacillating, or a kind of sham blow. —— DELTA.

STEAM TRAM CARS.

SIR,—Although I am not an advocate for the introduction of steam traction on our tramways, I do not think it would be altogether disadvantageous. The tram engines, to judge from their working at Wimbledon, Rouen, and elsewhere, are quite noiseless, run at a good speed, and are perfectly under control. In fact, they can be stopped more quickly than horses. The advantage, however, would be that the tram companies would be compelled to keep their lines in better order than at present, as there can be no question that the wear and tear of steam traction is much greater than horse traction, and that to make it pay a much larger number of journeys per day would have to be made. ENGINEER.

MINING PRIZES AND MINING PROFITS.

SIR,—In a letter written just three years ago (August, 1875) I observed—"Of all descriptions of home industries mining is the most remunerative, and yet the most difficult to understand, of all mediums open for the profitable investment of capital. Still, such vast wealth results to those who exercise prudence and a careful and earnest investigation of merits, coupled with the aid of the sciences and modern skill in the construction and application of machinery, that to the initiated the discovery of profitable mines is as certain and attended with no greater risks than are associated with shipping, building, insurance, banking, finance, and other popular commercial businesses. We have had evidences of late in the suspension and hopeless insolvency of reputed merchant companies to show clearly that the trade of the country is in many directions in a hazardous and extremely speculative position. We especially referred to the collapse of Collie, Overend and Co., Barnard and Co., Royal Bank of Liverpool, and numerous other financial firms, as warnings to the careful, and examples of reckless competition and the absence of all prudent tests of security. We also referred to the discovery of tin in Australia, and the necessity for retrenchment and the observance of more strict and recognised economies as affecting the efficiency and cheapening introduction of mechanical over manual labour—in boring machines, discharge of products from underground, drainage, dressing of ores, and in the general manipulation and conduct as a whole of mining operations, and we especially alluded to Dolcoath, Roman Gravels, Pateley Bridge, Carn Brea, Tincroft, Great Laxey, Van, West Tolgus, St. John del Rey, South Caradon, South Condurrow, Tankerville, Lisburne, Minera, Owles, and the Devon Great Consols"

Dolcoath shares have receded from 40 to 30, and the three years' dividends amount only to 5*l.* 4s. 7d. a share. Carn Brea has declared no dividend, though the shares have advanced from 35 to 40. Tincroft shares have fallen from 17½ to 8¼, and the dividends ceased from May last year. Again, Wheal Owles turned speculators in tin as well as mining; the operation proved doubly destructive, the accumulated ores fell off persistently in price, and the bankers charged heavily for over drafts—22,345*l.* A call of 62*l.* 10s. a share was made, but the indebtedness was over 275*l.* a share. It will take an immense bulk of tin ore at 35*l.* a ton to square the cost-book. All deep, expensive, and non-paying tin mines are as a rule valueless to the general public as investments. Landlords, merchants, bankers, executives, workpeople, and tradesmen, usually denominated the vested interests of the county, will alone be advantaged without an advance in price of tin up to 40*l.* or 45*l.* a ton—*i.e.*, a permanent move of 30 per cent. in favour of mines. There are tin mines, however, in Cornwall still profitable to capitalists, as, for instance, Wheal Peevor and South Condurrow; but these mines, in addition to being rich, are well handled, and commercial economies observed. There are no overgrown and cumbersome executives, retainers, and pensioners, who fatten on the declining worth of the metal, while shareholders receive only sparse, and in by far the more numerous cases no dividends whatever.

It should always be borne in mind that the first duty of executives and landlords is to render capital remunerative; and whenever revenue fails to meet costs, then that executive should cease to indulge in extravagance, and dues be reduced to a minimum impost. It is time for agents and managers to recognise the fact of mines being worked for the benefit of shareholders, and not of that alone of themselves, merchants and landlords. They are in their individual and united forms subsidiary and necessary, but by no means paramount elements of vitality. Roman Gravels, as was predicted, gave evidence of fast working, and it was suggested, to the manifest annoyance of a wonderful circular-monger, that the local agent should be awarded a medal for employing so many men in close contiguity, with a freedom from accident from blasting that was most commendable to his forethought and supervision. The price of shares is reduced from 14¾ to 7¼, or (say) 90,000*l.* in the entirety.

The dividends during the three years have been 33,000*l.*, but the price of lead will scarcely admit of so much in future. This mine has sold at 24*l.* per share (288,000*l.*) The price is now 90,000*l.*, which is the utmost value it ought ever to have sold for. The issue (par price) was 90,000*l.*, and the dividend has been 93,000*l.*, or just a return of capital miners' interest. The working capital was 8000*l.*, so that the promoters took 10-11ths of the capitalisation.

The Van has reached its full maturity, and it is evident that 20*l.* a share is wholly a fancy price for a mine only paying 5*s.* dividends quarterly from the sale of 500 tons of lead ore, and 200 to 250 tons of blende. This mine has proved a prize of 345,375*l.* from dividends alone, but it must divide gains of 2500*l.* a month without intermission to repay the present market value, and 5 per cent. interest up to the close of the present century, or (say) the year 1898. Great Laxey again is a very deep mine—considerably over 300 fathoms from surface. The dividends have been in the aggregate 23*l.* 19*s.* a share, and the last was 8*s.* for the quarter. The gains in dividends amount to 359,250*l.*, or just 300,000*l.* in excess of the capital. The price of shares (14¾ in August, 1875) were until recently 24*l.*, and now stand at 18*l.*—say 270,000*l.* for the property; so this hitherto prosperous, but now wrought to a depth of over 300 fathoms, must further yield double of past gains in the future to recoup purchasers' principal and 5 per cent. interest.

Lisburne has been a wonderfully good prize, and there is a future in favour of this adventure, yet the property sell for 25,000*l.*, or less than 10 per cent. of Great Laxey or the Van. Pateley Bridge, one of the most promising prizes on the tapis, is selling for 5000*l.*, an absurd anomaly when the discoveries made are recognised and compared with a Van, Great Laxey, Roman Gravels, Leadhills, Dolcoath. Again, who can otherwise than be struck at the difference existing in the values of a Peevor (20,000*l.*), a Mellanear (35,000*l.*), a West Tolgus (28,000*l.*), South Caradon (30,000*l.*), and a West Seton (8000*l.*), when compared with a Cambrian (150,000*l.*), East Van (60,000*l.*), Llanrwst (120,000*l.*), Tankerville (40,000*l.*), and Talybont (35,000*l.*)

Mining enterprise is one thing and reckless finance is another. Dealing in shares for gambling purposes regulated by the supply and demand of a few shares is a totally different operation from the vast gains acquired from dividends in such mines as the Par Consols, Fowey Consols, Lanescott, Phœnix, Devon Great Consols, Tresavean, United, Gorland, Damsel, Great Consols, Friendship, Godolphin, Seton, West Seton, Crofty, East Crofty, North Roskear, Tolgus, Harmony, Alfred, Botallack, Minera, East Rose, Trelawny, South Caradon, Bassets, Bullers, Carn Brea, Dolcoath, Cook's Kitchen, Tincroft, Van, Grogwinion, Lisburne, Great Laxey, Leadhills, West Chiverton, Levant, Goginan, and a host of others. No authority, however practical, observant, and intelligent can regulate or control the actions and conduct of inflated enthusiasts, fevered and excited gamblers, or reckless financiers who float on the surface current of events, but this we contend can be obtained, controlled, and rendered applicable and profitable to capitalists—sound, intelligent, and useful data and intelligence in respect to *bona fide* and legitimate mines and mining, and such only should be recognised and dealt in by the disciple of the science of investment.

R. Tredinnick,
Dealer in Stocks and Shares.

Exchange, Coleman-street, London, Aug. 2.

THE DUTY OF CORNISH PUMPING-ENGINES.

TO THE EDITOR OF THE WEST BRITON.

Sir,—The pressure placed on me in reference to the conversation that followed the reading of Mr. Husband's lucid paper on May 28—[see *Mining Journal* of June 22 and 29]—will no longer permit me to be silent. The essential points in my last letter are taken up by Mr. Husband in his paper, and I confess to great satisfaction, in common with others, that a man of so solid an intellect has dared to follow up the facts which, but for my letter, would have for ever slumbered. The historic and, indeed, all other portions of his paper not bearing on the duty of the engines in 1838 and 1844, and the duty of engines in 1878, I for the present pass over. In 1844 it is admitted that the average duty of the Cornish engines was 68 millions, and that, in order to reach that average, certain engines did a duty of from 80 to 100 millions, whilst in 1878 the average duty is only 49 millions, and the highest duty is but 68 millions. The averages show a decline in duty in 1878 as compared with 1844 of about 39 per cent. (not 40); this decline of 39 per cent. would reach something over 50 if all the engines now working in the county were included. It should be borne in mind, especially by the northern engineers who will read this letter, that only 14 engines in 1878, as against 37 in 1844, are reported.

Lord Derby said that the same result as now obtained might be obtained by the consumption of one-half or even two-fifths of the coal now used. It is clear (indeed, I can speak of it as a fact) that Cornwall was not excluded, but included, in Lord Derby's statement. It may be information to Mr. Loam to be told that the present Lord Derby visited Cornwall and made a special survey of Dolcoath. It is to me, as to others, a mystery how that Mr. Loam, in the face of an admitted decline of 39 per cent., could be so weak as to say that Lord Derby's remarks could not apply to Cornwall. His friend, Mr. Husband, has by this time, in his quiet way, recommended, I have no doubt, investigation rather than assertion, and I would, for his sake also, seriously join in so prudent a recommendation.

Mr. Loam says, in speaking of 1838 and 1844, when a duty of over 100 millions was obtained, the engines were new, the shafts were perpendicular, the surveillance was perfect, and every regard paid to the training of men who had charge of the engines, and that the evaporative power of the coal was recorded at 9½ gallons for each pound of coal, leaving us to infer that since 1844 no new engines have been erected on perpendicular shafts, and that no cases parallel with those in 1844 can be cited. I am, however, told that there have been so many that their name is legion, and that in the Chiverton district there is one now working under circumstances in every way favourable to duty (a 78 or 80, erected by Mr. Loam, and planned on a scale of strength that nothing could shake) with a duty so wretchedly low as to be considerably under some of the old rattle-traps referred to by Mr. Husband, and cannot even be named in comparison with the engine at West Seton 38 years old, doing 68 millions in a crooked shaft. If this engine, which was second-hand when erected at West Seton in 1840, is called pre-eminent because it performs 68 millions duty, what term can be applied to new engines on perpendicular shafts doing a duty so low as not to be mentioned?

The Chairman, in his usual gentle way, reminded Mr. Loam that, notwithstanding the alleged drawbacks to duty in not having vertical shafts, it could not be taken into account, because the highest duty now recorded in Cornwall was in connection with an engine on a crooked shaft. The decline in the duty of Cornish engines is so well-known in the county and out of it that it will surprise no one studious in mechanics to have it painfully confirmed. The first step in the investigation of this subject is, as Mr. Husband says, to determine how far we are working on the same system as the men of the last generation, and where we differ. By system I will include all that is economic. First, let us deal with coal, which, according to Jevons, "stands not beside but above all other commodities. It is the material energy of the country, the universal aid, the factor in everything we do. With coal almost any feat is possible or easy. Without it we are thrown back into the laborious poverty of early times." Mr. Husband says that when 101 millions duty was attained in 1838, Lean's Engine Reporter shows that for the last six months in that year 700 tons of coal were consumed; the feed measured 14,638.125 lbs., giving to each 1 lb. of coal an evaporating power of 9·335°, with a temperature of feed averaging 102°. The evaporative power, Mr. Husband says, was high, being equal to the best Welsh coal of the present day. Mr. Loam asserts from an experience of 40 years, or since 1838 down to the present time, that the experiments tried in Cornwall proved that they evaporated from 9 lbs. to 10 lbs. of water to the pound of coal, at a pressure on the boiler of from 30 lbs. to 40 lbs. to the inch. We have in this confirmatory assertion of Mr. Loam's a surprising admission, and one that Capt. Teague will not fail to note, that with a pressure of from 30 lbs. to 40 lbs. to the square inch the evaporation was from 9 to 10, as against 9½ and 101 millions with steam at 60 lbs. to the inch. If the coal supplied the mines be good, and this Mr. Loam in the most emphatic way supports, we must, as Mr. Husband says, look not to coal for our remedy for the decline in the duty, but elsewhere. I may, however, without in any way prejudging the assertion of Mr. Loam, intimate to him that a publication of the experiments as to the evaporative power of coal supplied to the Cornish mines will be intensely interesting.

I know of six experiments made (tested by a water meter) on coal taken from six of the best Welsh pits, in boilers working at 60 lbs. to the square inch on large coal, approved by Government, without in a single instance reaching 10 lbs.; and the coal used in H.M. Navy, and in the Serapis on her homeward voyage, barely averaged 10 lbs., where the stokers were trained to perfection. But, turning aside from this question of test in Wales and in H.M. Navy, I will accept Mr. Loam's assurance at present, and refer to a point named in my last letter, which Mr. Husband has taken up and put into a form of weighty words—"where a good duty is not attained, it is necessary to measure the water evaporated by the coal used; also to ascertain the indicated horse-power, and determine the effective horse-power by calculating the quantity of water, and the depth from which it is pumped. We can then determine," he says, "whether the fault rests with the boiler and coal, or the engine and pitwork." Your readers may ask, how is it to be done, and by whom it is to be done? Mr. Husband, again, says it is the duty unquestionably of the engineers; but as they will not do it, I would refer your readers to a very simple piece of mechanism called a water meter, costing with piston about 45*l.*, which will indicate with unerring precision the quantity of water evaporated, minute by minute; and if an hourly record were made in a book it would, as Mr. Husband says, then determine whether the fault was in the coal or engine, &c. A meter such as I speak of would be equal to the service of an engine supplied by six boilers. There is a firm who, by using this test, tested a variety of coal, and found that one sort not much noted in the market gave a higher evaporating power than any of the others; and in this way, by the greater effectiveness of the coal and the lessened price, saved 38*l.* per week. The erection of such a machine at West Seton or Dolcoath would initiate a movement fraught with enormous economic issues. The other method is by measuring the quantity of water passing through the condenser, noticing its rise of temperature, and simultaneously taking diagrams of the power developed by means of the indicator, which is the acknowledged instrument for showing the power exerted by steam-engines. The best time to apply it is when the work is regularly going on; but let me entreat Mr. Pearse, Mr. Rule, or some such adventurers, to have one or the other done without delay.

Mr. Loam is reported to have said that the Cornish engine, from an experience of 40 years, is what it ever has been, the best engine for the use of steam and pumping. I need not say that best and worst are relative terms, and that it is logically difficult to deal with generalities, especially when they are illogically jumbled; but it will not be deemed outrageous if I say that an average of 68 millions has no fellowship with anything so low as an average of 49 millions, or of 101 millions highest duty with 68 millions highest duty in the present day. There are those still living who recollect with pride 101 millions. They look back and say, *Olim sic erat*; but as the mantle of Elijah has not fallen on the shoulders of Elisha, we must bemoan our lot, and call the spirits from the great deep to see if they will help us.

Again, Mr. Loam says the falling-off in duty is due to preventible causes. It is needless to say that he lost a splendid opportunity of redeeming engineering disgrace by not going into them in detail. It would deeply interest me, Mr. M. G. Pearse, Mr. Rule, and other speculators, if Mr. Loam would enrich your columns with particulars of these preventible causes. At all events he could, for the information of West Seton adventurers, make out a report showing how it came to pass that a mine in a quiescent state as to sinking should perform a duty of 55 millions in 1877, and a duty of 68 millions in 1878.

Mr. Husband puts down the yearly loss at 4800*l.*; but were all the engines reported, and the economies that would follow suit in grease, oil, &c., estimated, the loss is nearer 20,000*l.* for the county than 4800*l.* for the 14 engines in question. Mr. Husband is somewhat at fault in referring to the stoking and the component parts of the air being formed, four of nitrogen and one of oxygen. Would it not be more correct to say one-third of oxygen and two-thirds nitrogen? But in reference to this he omits a cardinal calculation found in the composition of good coal—5 per cent. of oxygen, which helps the fire and neutralises, to a great extent, the nitrogen. The air required to effect the combustion of 1 lb. of coal is 12 lbs. The air can be so regulated as to secure, on this principle, perfect combustion.

Capt. Teague, in speaking of the combined engine working at Carn Brea, says he saved several tons of coal by lowering the pressure. I have read that whereas a single-cylinder steam-engine—*i.e.*, where the steam does not pass into a second cylinder before going to the condenser—will require from 40 lbs. to 50 lbs. weight of steam from the boiler per hour for every indicated horse-power, a compound engine will require only from 20 lbs. to 30 lbs. High pressure is universally accepted by engineers as the true road to economy; but it is very questionable, to my mind, whether it applies to all cases. Indeed, I have seen the assertion contradicted in practice; and as to expansion and long strokes, it is a question that Mr. Loam would do well to enquire into, whether these matters do not in many instances account for the great falling off in duty.

By all means let the engineers have their way, as suggested by Capt. Evans, but let them be informed that, with this granted, 101 millions must be attained, or their services will be dispensed with. There is no excuse for the falling-off—this is Mr. Husband' assertion. Let the adventurers unite with him, Capt. Teague, Capt. Rich, and a few others, and I am sure Mr. Husband will, in conjunction with the engineers, bring about a saving that will perfectly startle such quiet adventurers as Mr. Pearse, Parson Butlin, and a few others. Mr. Loam will, I hope favour me with a list of the fallacies and absurdities of my last letter. I don't deal in assertions nor asperities. They are beneath intelligent notice. I knew Mr. Woolf, and it was under my hospitality that he partook of ducks and green peas—the last dinner he had with a Cornishman. The conversation about steam expansion and the generating of steam nearly cost him his life. He swallowed peas without limit, and the leg of a duck in his hurry choked, for a time, his speech. Were he here, instead of allowing weeks he would not allow days to pass without agitating the county from one end to another to remedy the present disgraceful state of things. I say to Mr. Loam, go and do likewise.

Omicron.

The Cornish Miner at Home and Abroad.—At West Wheal Frances meeting, last week, Mr. Carter asked whether it was not possible for Cornish miners to do more work than they were accustomed to do? He had heard it stated over and over again that the Cornish miner in America received more pay than in Cornwall, but that they worked almost doubly as hard, and that were they to do the same amount of work at home as abroad they would earn as much wages.—Capt. Abraham James said it was his impression that the Cornish miner could get more money at home if he were more industrious, and more attentive to his labours. He invariably found it a difficult thing to get men to work more than six hours a day. That at first might seem a little startling, but if they were to look minutely into the matter it would not appear so startling. The men were supposed to get underground at seven o'clock, then against they had smoked their pipe it might be half-past seven or eight o'clock. They would then proceed to work, and he had frequently seen them at twelve ready to go to the surface. In fact, on an average he did not think they worked more than five hours a day per week. The question with them was—"How little can we do?" It seemed to him that the greatest part of their time was taken up in trying to conceive the best means of doing the least possible work for the money. He believed the present system, although it had answered for so many years, was then almost "worked out." The system which he would like to see adopted and to which he would lend himself was that every man who would work should have good pay. (Hear, hear). Let, for instance, every man in a "pare" have a certain work to do, and then it would be impossible for any man to "sponge" upon his comrades. If they did not have their ground they would not have any money, and those who did the work would have the pay. He was quite prepared at any moment if a better system were adopted to do all in his power to carry it out.—Mr. Husband said the point was to have some agents to carry the suggestions into practice.—Capt. Josiah Thomas said the men could not come up in their mine before the eight hours were up, as the engine was not working.—Capt. James: It was not a question as to the time the men were underground, but as to the work they did when there. If they worked the same number of hours here as they did in America or Australia they would get one-third or one-half as much money more as they usually did.—After some further unimportant remarks the meeting separated.

MINING IN ST. JUST—LEVANT MINE.

This celebrated old mine which gave to its fortunate shareholders the sum of 200,000*l.* profit on an outlay of 400*l.* only, having been resuscitated by the new company is again showing its productiveness. During the past four months 222 tons of copper ore have been raised, of the estimated value of 1800*l.*, and about 75 tons of tin. The mine is opening very satisfactorily, the north lode being at present most valuable. The 260, west of the submarine shaft (which is upwards of 200 fms. under the bed of the ocean), is worth 10*l.* per fathom; the 260 east is worth 6*l.* per fathom; the 250 east is worth 5*l.* per fathom; the 240 west is worth 7*l.* per fathom; the 210 east is worth 10*l.* per fathom; the 150 west, on the south lode, is worth 15*l.* per fathom. These are at present the most productive points. At the setting, on Saturday last, the tutwork shows the submarine shaft and three winzes sinking; sixteen ends driving and six stopes; and the tribute, 32 pitches, varying from 5*s.* 6*d.* to 17*s.* in 1*l.* The total number employed on the mine is 237 men and 86 boys and girls.

The Eastern Question now being settled and peace established, a revival in trade throughout the world is generally expected, and the prices of metals will doubtless reap a fair share of benefit therefrom. When such is realised Levant, which is about stemming the tide, will reward its adventurers for their outlay and perseverance.

The setting and pay being completed, on Saturday the principal agents with a few friends sat down to a plain substantial dinner, after which an animated discussion took place as to the future of Cornish mining, all being agreed that should an effort be now made they would be able with a slight rise to compete with the foreigner. Mr. Sholl (the patentee of the Pneumatic stamps) stated that serious depressions like the present have always suggested the old adage, that "Necessity is the mother of invention," and to satisfy the cupidity of our nature the love of money has generally been the insentive to strongly combat against these periodical visitations by the best means circumstances will allow. Take, for instance, the history of America within the last half-century. Labour has not only been scarce, but skilled labour often impossible to obtain. The indefatigable Anglo-Saxon has met these difficulties by the introduction of labour-saving machines in every branch of industry, and they are now supplied with every requirement from a steam-plough to an egg-beater. I used to think that the very nicest "sewing machine" in the world was a pretty girl gracefully and deftly plying her needle and thread. My opinion has not materially changed now, except that the iron and steel substitute does its work more quickly, and consequently more effectively. These remarks lead me at once to the boring machine and the high speed stamps, whose motto should be, "If it were done, when 'tis done, then 'twere well 'twere done quickly." The "hare being caught," or the tinstone being in the mine, the more quickly it can be brought to the surface the better, and this can only be thoroughly effected by the use of mechanical drills, and by more effective and in some cases better paid labour. Let the representative Cornish miner show that he can earn by his work at home a sufficient wage to support his family, and he would not require to risk the uncertainties of extremes of climate, and other discomforts too numerous to mention in foreign climes. The augmented quantity of tinstuff being at surface the more quickly it is stamped the better, and although it is not for me to say much about the "Pneumatic stamps," yet I think you all know we have proved during the past week beyond a doubt that Botallack fine tin can be flushed as effectually with much greater rapidity and with less fuel than has ever been done up to this time. These several energies being enforced with a gradual and permanent rise in the price of the mineral—say, 55*l.* or even 50*l.* per ton—and our Antipodean rivals will find it difficult to compete with us, particularly when the laws of supply and demand fall back into their normal channels.

NEWPORT AND CARDIFF AS SHIPPING PORTS.

The inconvenience and annoyance experienced by merchants and shippers who have been in the habit of using Cardiff as a shipping port have constantly been brought before the public, and the course recently adopted by the Cardiff Pilotage Board promises to make the dangers of and objections to the port so widely known that few to whom time and economy are of any consideration will have the temerity to use it, especially as all the advantages without the obstructions can be secured at so short a distance as Newport. That Nature has placed a large and dangerous shoal—the Cefn-y-Wrach—to bar free ingress to and egress from Cardiff is the misfortune and not the fault of those interested in the port, but to endeavour to compensate for that misfortune by punishing pilots of many years' experience at the port is not only an injustice but a mistake, since it has led to the publication everywhere of the insuperable dangers of the Cefn-y-Wrach shoal, about which it was to the interest of the pilots, as well as of all others connected with Cardiff, to say as little as possible. The port of Cardiff has grown marvellously within the past 30 or 40 years, and deservedly so, for every effort has been made to improve it and make it attractive to shippers, and it may probably be attributed to the slackening of those efforts, and thus letting the port return to its former condition. It appears from the statement made before the House of Commons by Mr. Venables, Q.C., on behalf of the Bute trustees that "the vessels using the Bute (Cardiff) docks have not been able to benefit entirely by the depth of water on the sill, because outside there was a shoal (the Cefn-y-Wrach) through which some years ago Lord Bute's trustees cut a channel, which channel had partially silted up so as to make the water on the passage through the shoal a foot or two shallower than the water on the sill."

Now, this "foot or two shallower" represents the entire question upon which the unfortunate pilot, John Howe, who has honourably held a first-class certificate for 21 years has been suspended. Howe, as well as all the other Cardiff pilots, were perfectly well aware to what extent the passage was silted up, yet for refusing to undertake the responsibility of navigating the Royal Minstrel (drawing 19 ft. 8 in. of water) through this intricate Cefn-y-Wrach passage, wherein there was but 19 ft. 2 in. of water at the top of the tide, he has been deprived of his livelihood for 12 months by the Cardiff Pilotage Board, which is alleged to be composed of gentlemen who have no nautical knowledge whatever. From the report of the meeting of pilots with reference to the action of the Pilotage Board it appears that the pilots have given the silted-up passage at Cardiff the not very complimentary title of "the drain," and it was stated that "if a pilot took a vessel down the drain on a dark night," and anything happened to her the dock master who had compelled the pilot to take her out against his judgment was hardest against the pilot at the Pilotage Board. It is alleged too that the captain of a ship which had managed to grind her way through the Cefn-y-Wrach passage would sometimes proceed to sea, saying to the pilot "For God's sake don't say anything more about the ship having touched the ground." His note was then filled up; he had taken the ship out all right, and he received his money at the office. From this it would seem that the Cardiff pilots have the alternative in such cases as that of the Royal Minstrel of acting dishonestly by letting a ship plough its way out of Cardiff, or of offending the dock-master and the Pilotage Board, and thus incurring the heavy penalty of suspension. Which course a man who has only his pilot's dues to depend upon would take may readily be guessed.

But the remedy is to a great extent in the hands of shipowners

themselves—they can ship from Newport, where there is now shoal, and where the dock accommodation is equally good, and upon the completion of the Pontypridd and Caerphilly link of railway, which is already authorised, and is only some six miles long, the facilities for mineral traffic between Aberdare and the Rhondda Valley and Newport will be so vastly increased that Newport will be in every respect the most convenient and economic shipping port for the coals from those districts. As all the speeches and correspondence bearing upon the matter have been carefully collected (Newport: Henry Mullock and Son) in a shilling pamphlet, those interested have ample opportunity to study all the details of the subject.

Meetings of Public Companies.

CARDIFF AND SWANSEA SMOKELESS STEAM COAL COMPANY.

The fifth ordinary annual general meeting of shareholders was held at the City Terminus Hotel, Cannon-street, on Tuesday,

Mr. MOSLEY in the chair.

The CHAIRMAN expressed his regret that Mr. John Davis, the secretary, was unable to be present at the meeting owing to illness. The notice convening the meeting was then read, and the report and accounts were taken as read.

The CHAIRMAN then said: Gentlemen, since we met twelve months ago the coal trade of England has passed through a year of depression which has exceeded in intensity even that of the two or three years which preceded it. Not only have prices universally declined, but in many colliery districts in England the demand has fallen off to such an extent that owners have had the greatest difficulty in keeping their pits going two or three days a week, and in many instances they have been obliged to close them altogether. In some of the colliery districts, too, great trouble has been experienced through strikes and disputes with the men. I have many acquaintances amongst owners and managers of large collieries, with whom business brings me frequently in contact, and on all sides I hear universal complaints of the serious losses that have been sustained during the past twelve months. Were private firms obliged, as public companies are, to lay their balance-sheets before the public, I have not the slightest doubt that some very astounding results would be shown as to the losses which have been sustained. I met yesterday a member of the firm of Messrs. Cooper Brothers, our auditors, and what he told me completely corroborated what I had heard elsewhere as to the dismal state of the coal trade, but he added this gratifying piece of information—that the accounts of this company's working during the last year would bear very favourable comparison with those of many other concerns of a similar nature whose accounts had passed through the hands of his firm, and I have his permission to state this to the shareholders. I think myself that so far from the shareholders experiencing any feeling of disappointment at the result of the year's working, that during the extraordinary crisis we have passed through it is a matter for great congratulation that we have weathered the storm so well as we have done, in which other concerns have gone down. Several shareholders have on many occasions expressed a hope that our loss for this year would not exceed that of the previous one, and, therefore, they at least will have received the report and balance-sheet with feelings of considerable satisfaction that our loss on the year's working does not come up to barely one-half of what it was last year. I hope and believe the coal and iron trades of this country have already passed through their worst stage, and that better times are nearer than some of us imagine. There is no doubt that a very hopeful and confident feeling has arisen lately amongst all classes of business men, and now that peace has been restored on the Continent, and with a prospect of a good harvest, the accounts of which are most encouraging from all quarters, I venture to predict that a speedy revival of the trade of this country will very soon come to pass. As regards the Pentre Colliery, we have had a year of very regular working, interrupted only by a strike of a few days duration. The output has been disposed of by our Cardiff agents—Messrs. Cory Brothers and Co.—at the highest prices that are realised at the port of Cardiff. The trade, however, of the Swansea district until the last few weeks has been in a state of extreme slackness and depression, so that it has been found a matter of the greatest difficulty to keep the colliery going at half its capabilities. We have also had our working there interrupted by a strike of a month's duration. The board has thought it a wise policy to stop the working of several of the levels during the present depressed condition of trade, so as thereby to introduce economy in working. The prices at which we have been obliged to tender for our Resolven coal for contracts to the large steamship companies at Liverpool have been very low, owing to the competition to which we are exposed from neighbouring collieries, and as an instance of what those prices are, I may mention that a neighbouring colliery has accepted a tender at a price which we have reason to believe will leave them only 4s. 9d. per ton for large coal at the pit's mouth. We are glad, however, to notice a very considerable improvement in the last few weeks, and we hope this will not only be maintained, but that it will be increased. The attention and exertions of the board have been during the last 12 months more particularly directed to a close investigation and, wherever possible, a reduction of every item of expenditure at the collieries, so that the coal has been cut down to the lowest possible price; but, at the same time, the workings and plant of the collieries have been maintained in a full state of efficiency and good repair, and it is due to our manager—Mr. Wm. Thomas—to say that he has given throughout his close and unremitting attention to all these points. Mr. Walker and myself have on two or three occasions been down to the collieries, where we have spent many hours each day in investigating every item of expense, and reducing wherever it has been possible even to such a small sum as a halfpenny. I may mention here that this is not a usual thing for directors to do, but still, as we felt that the prosperity of the company depended upon the saving of every halfpenny, we have spared no time or trouble to effect the object in view. The result of this is that independent mining engineers have given their opinion that the collieries are now being worked as cheaply and efficiently as it is possible to do under the existing circumstances. When we met here last year a question was asked by a shareholder, what would be the position of this company presuming that the last 1*l.* per share were called up? The answer was that we were perfectly solvent, and able to pay our debts, but that unless we received assistance from somewhere we should be obliged to make a call; and it was to be earnestly hoped, however, in the interests of the company that this could be avoided. On that occasion the vendors, Messrs. Cory Brothers and Messrs. Cory and Yeo, came forward, and very liberally and very generously offered to forego the immediate payment of their debenture interest, and to offer the company every financial assistance should it be required, in order to avoid making a call. It is a matter of very great congratulation to the board themselves that we have been enabled to pass through the last trying twelve months not only without making a call, but, as you will see by the balance-sheet, crediting the debenture interest to the gentlemen to whom it was due, although they had kindly promised to forego it should it be required. I believe that these payments have been carried by them to a suspense account; but at all events they appear as a charge against the company in the balance-sheet. There are one or two items in the accounts which I should wish to point out. The first is that among the open accounts is included a sum of 1750*l.* for dead rent, due to the landlord of our Resolven property, and I may here mention that Major Vaughan Lee is a very great personal friend of myself, and one of my colleagues at this board, Mr. Boden, and we have missed no opportunity of asking him to do anything that lay in his power to forward the interests of the company of which we were directors. The result was that in the winter of last year, after some interviews and correspondence, he agreed to allow one-half of the dead rent of Resolven—the 1750*l.* I have mentioned—to remain in abeyance until times improved, and the company was in a more prosperous condition. Well, gentlemen, we were hardly satisfied with even that assistance on his part, although I must say that, considering he has no interest in the Cardiff and Swansea Company beyond the personal one which he has for myself and my colleague, it was very kind of him to make the offer; and we further asked him whether he would not forego altogether the dead rent which he had promised to allow to remain in arrear, and I have a communication from him to say that he is willing to accede to this request if within one year from the present time we will so far fulfil our covenant, by which we are bound under the lease, as to sink to the No. 2 seam, at an expenditure of about 8000*l.* or 10,000*l.* in round numbers. On these conditions he will forego the half dead rent entirely, thereby making a present to the company of somewhere about 3000*l.* or 4000*l.* It must be remembered at the same time that we are now under a covenant to Major Lee to expend a sum of 70,000*l.* or 80,000*l.* at least in sinking to what is termed the "lower measures;" but this he has kindly offered to forego if we will fulfill the covenant by which we are bound to the seventh or eighth part of this amount, and I think that the thanks of the shareholders are due to Major Lee for the kindness and consideration which he has extended to us in this matter. I have now, gentlemen, given you very shortly a *resumé* of what this board has done in regard to the working of the collieries during the past year, and the position of the company, and the steps which they have taken to meet as far as possible the extraordinary stagnation of the coal trade, and to reduce the expenses of working and other charges to the lowest point, and I may say that our task has been one of no small difficulty. It has taken us a great deal of time and trouble and close personal attention to carry out the reductions which we have effected, and it is a matter for very great congratulation to us that we are enabled to meet you here to-day, presenting to you the balance-sheet which you have had, and without having occasion to ask you for any further portion of the uncalled capital of the company. I beg to conclude by moving the formal adoption of the report. (Applause.)

Mr. WALKER, in seconding the motion, expressed his satisfaction at the progress made at the Pentre Colliery, and with respect to Resolven, he believed that to be a very valuable property, if they had only the means of increasing the output and so reducing the general charges.

Mr. HELBY asked whether the item of 9139*l.* "to debtors" was composed of all good debts?

The CHAIRMAN: I believe they are; I think Mr. Cory can tell us the position of our customers.—Mr. CORY: We have only ourselves and Mr. Yeo.

Mr. WHITE remarked that the company was fortunate in making very few bad debts.

Mr. HELBY asked what the item of 744*l.* 14s. arrears due by shareholders represented?—The CHAIRMAN replied that that was for unpaid calls. The directors had done everything they could in fairness to the shareholders to collect the calls in arrear. They could have adopted more stringent measures, but they were anxious not to do so if it could possibly be helped; but he hoped the arrears would soon be paid. The Chairman also replied to a few questions of minor importance, remarking that the directors had left a portion of their fees in abeyance until the times were more prosperous.

Mr. WYLDE asked what was about the estimated cost of the new shaft which the Chairman had stated would have to be sunk?

The CHAIRMAN replied that the company was bound under its covenant with Major Lee to expend (as stated in the prospectus) a sum of 90,000*l.* in sinking to the lower measures; but Major Lee had agreed to forego his half dead-rent if the company would sink to a depth of about 80 yards to the second seam, at a proximate cost of 8000*l.* or 10,000*l.*

Mr. MCCULLOCK said he did not know that he had ever seen a fairer balance-sheet than that presented to the shareholders. He was very pleased at the results of the year's operations, which showed that but for the Resolven property they would have been able to pay a 2 per cent. dividend. (Hear, hear.) He thought the balance-sheet reflected very great credit on the directors and the manager, Mr. W. Thomas.

Col. SHAKESPEARE asked if the amount due on the debentures had been paid, or was it in abeyance? And he noticed with regard to the royalty that it was 1660*l.* in excess of last year, although the output was smaller.

The CHAIRMAN, in reply, said the amount due on the debentures had been charged in the accounts, but it was in abeyance. With regard to the royalty, the reason of the increase was that they had worked more coal from the Church portion—a larger portion than usual; and, as that had to be taken through the Pentre property, the company had to pay a way leave of 1d. per ton; besides, the output at Resolven being far short of the amount to cover the dead rent would, probably, account for the difference.

Mr. RUSSELL EVANS thought the balance-sheet a very satisfactory one, and one which would compare very favourably with many other similar companies. It spoke well for the management at the colliery and the general supervision exercised over the property.

Mr. CORY, in reply to a question, said the commission was calculated on the price free on board, which included a guarantee against bad debts.

The CHAIRMAN said he was sure no shareholder would grudge Messrs. Cory Brothers their commission, for he believed they earned it most thoroughly. (Hear.)

The report and accounts were then unanimously adopted.

The CHAIRMAN then said he wished to refer to a matter about which some remarks had been made. In the winter of last year, when Resolven was working very badly, and the trade of the district was in a most lamentable condition, the directors approached Messrs. Cory and Yeo to ask them if they could do anything to assist the company, and if possible to reduce the loss which it was believed they were then making at Resolven. After a good deal of correspondence, and one or two interviews, he (the Chairman) went down to see those gentlemen, and after several interviews he made a proposition to them, which was that they should take over the management of Resolven Colliery into their own hands, and give the company an increased dead rent and an increased royalty, which would mean a profit on the present working of the colliery of between 2000*l.* and 3000*l.* a-year. Their answer was, he was bound to admit, perfectly fair and frank, and one to which he could hardly reply. They said, "You ask us to take over the colliery, at the present time making a considerable loss, and then ask us to sustain a further loss in giving you money out of it." But after a great deal of negociations, which were carried on in a most straightforward manner, the directors had the day prior to the meeting received the following letter from Messrs. Cory, Yeo, and Co.:—

"DEAR SIR,—At your last general meeting the opinion was very strongly expressed by some of the shareholders that as the Resolven part of your property had been a source of loss during two or three successive years, it was to the interest of the company to give it up to the landlord, and confine the operations of the company to the Pentre Colliery. As the working of the past year shows a further loss it is possible that some similar opinions will be expressed at the forthcoming general meeting. We have to say emphatically that in our opinion this course would be unwise in the extreme. We feel sure that when the present extraordinary crisis is passed this colliery will prove to be of very great value to the shareholders. You will remember that some three years ago, after the commencement of the present crisis, and after you had had the colliery sufficiently long to form a judgment as to it, we showed our opinion of its value by making a positive offer to the shareholders to repurchase it at the price which had been paid for it—*i.e.*, returning all the debentures, shares, and cash which we had received for it, and recouping the company in cash any outlay they had made on the property. That offer after full consideration having been rejected, we should certainly have made no further overture of that nature had you not recently invited us to make some suggestion or proposal in reference to Resolven. The vast depreciation which colliery properties have undergone of course prevents us renewing to you the offer which we then made, but having still great faith in the future of this colliery we beg to suggest the following as far preferable to any 'giving up of the colliery':—The total value of shares and debentures which you paid us for Resolven was about 137,000*l.*, besides a sum in cash of about 28,000*l.* We are prepared favourably to consider the following terms for the repurchase of the property—that we return you the whole of these debentures and shares, of the value of 137,000*l.*, and that we also return you the 28,000*l.*, but instead of giving you this latter sum in cash, that we hand you the amount in the ordinary shares of the company (with final call paid up), thus making up the total sum of 165,000*l.*, which we received for the property. We would not compensate you for any outlay on the property, that outlay being for the most part unproductive, and the output of coal being no greater now than when we sold the colliery. This suggestion is made only on the assumption that the company contemplates surrendering the colliery to the landlord, and as an alternative to that, in our opinion, very unwise course—We remain, yours faithfully, CORY, YEO, and Co."

That letter having been received so lately no action could be taken upon it, but it was a matter open to the consideration of the shareholders. When the offer was previously made their late Chairman (Mr. Shaw) expressed a very high opinion of the value of the Resolven property, stating that the only thing it required was capital to work it thoroughly. He (the Chairman) to a great extent shared that opinion. The property had the best part of a 99 years lease to run, the railway ran very close to the port of Swansea, and docks were about to be constructed at Neath which would reduce the charges still further. Of course, the great question was if they retained the property where was the money to come from to develope it?——A conversation took place on this subject, in which Col. Shakespeare, Mr. Mr. McCullock, Mr. R. Evans, Mr. Helby, and Mr. White took part.

It was ultimately decided that the matter should be left in the hands of the directors to consult with some of the principal shareholders as to whether the offer, with its conditions, should be accepted, or whether the company should retain the Resolven property.

On the motion of Mr. HELBY, seconded by Mr. MCCULLOCK, the retiring directors (Messrs. Walker and Boden) were re-elected. The auditors, on the motion of Mr. RUSSELL EVANS (Messrs. Cooper Brothers and Co.), were re-appointed.

The meeting then terminated with a cordial vote of thanks to the Chairman and directors.

CESENA SULPHUR COMPANY.

The annual general meeting of shareholders was held at the offices of the company, Finsbury-circus, on Friday last,

Mr. C. SCHIFF in the chair.

Mr. R. LARCHIN (the secretary) read the notice convening the meeting. The minutes of the previous meeting having been confirmed, the reports and accounts were taken as read.

The CHAIRMAN said—Gentlemen, I suppose you have all read the very exhaustive report that we have annexed to our yearly report—that is, the report from our managing director, Mr. Kossuth. Mr. Kossuth having come to London for the purpose of assisting the board in going through the accounts and balance-sheet, is still here. He leaves, I think, to-night. Before I comment further on the report I will request Mr. Kossuth to be kind enough to supplement it by any remarks that he may have to offer on the subject. You will then be in a position to know exactly how our works stand. After that I shall make a few comments, and then move the adoption of the report.

Mr. F. KOSSUTH (managing director) said—I suppose that all present have read my report, dated Sept. 31 last, and will have observed that the progressive development of our mines was kept up also last year. Our extraction showed an increase of 12,556 tons of mineral, and our production an increase of 1134 tons of sulphur, the value of which increase, even at the present low price, is 5147*l.* 5s. 5d. This increase unquestionably proves that the numerous difficulties met with during the year, in the shape of barren plots and strikes, have been satisfactorily overcome, and that everything proceeds fairly as far as the working of the mines goes, excepting the output at the Polenta Mine, where we had a heavy loss, owing to the persistent barrenness of the seam, which forced us to carry on works of search, rendered very expensive by the abundance of water in this mine. The share of our principal mine—Boratella—in this increase has been 8109 tons of mineral, on which fact I lay considerable stress, because 1877 was the first year that no investment of capital was made at this mine. To secure the continuation of this large output, so that we have now proved satisfactorily what might have been questioned—that it is possible to work these mines profitably without constant and progressive investment when once they have been provided with such works both under and overground as are indespensable for making their intrinsic value available. Last year a large portion of the profits made at Boratella, and left clear of all charges on them, either technical or commercial relevant to this mine, has been absorbed by the requirements of the development of Borello Mine, on which 1465*l.* 10s. 5d. has been spent. This mine was only placed in working condition at the end of the year, without at that time having been provided with more than two kilns, the production of which will pay for making successively during the course of 1878 a larger number of kilns, which as soon as built will be put to production. A much larger sum of the net profit of Boratella—that is, 3973*l.* 3s. 6d.—was absorbed by Polenta, out of which large sum (larger, indeed, than that what was left available for dividends) a portion—that is, 2832*l.* 3s. 6d.—was a clear loss, the remaining 1141*l.* being invested in works profitable in future. I dwell upon this subject because it is the only black point in our steadily bettering condition. I must say, however, that this year (1878) I still have some hopes that the profit on the sulphur made at Polenta and the loss on this mine will balance, or if not this loss will certainly absorb a considerably smaller portion of our net profits. It would be very natural to question the advisability of going on with Polenta, and there is no doubt that the mere fact of giving up this mine this very day would be adding so much to our net profits. I feel bound to point out, however, that earnestly concerned as your board and myself have always been to deal with our collective property as carefully as if it were exclusively our own private property, we felt that we must be very reluctant to diminish that capital value which we have in exchange for the large sum paid by this company as purchase money for the mines. We could only recommend you, therefore, to give up a mine in case it were very clearly proved that no reasonable chance existed to make it a paying and, therefore, a valuable property. I must clearly state that I have not yet acquired this certainty—far from it. I have much hope, derived from the local conditions of the geological formation, that this unsatisfactory condition of Polenta will soon cease, and I might as well satisfy you briefly on my reasons by mentioning that the local conditions force us to place our works where in some geological period subsequent to the pliocene the thalway of a large torrent existed, and produced its peculiar effects on the sulphur seam, which effects are to erase the sulphur out of the matrix of the seam. Even without being a miner any man will easily understand that if this geological appreciation is correct, the conditions of the strata being eminently sulphur-bearing to the right and left, only two things remain to be done—to work to the depth at which the peculiar effects of the pre-historical torrent would cease to be observable, and work to the right and left, or to go out of the width of the area on which these effects were produced. In our special conditions, having to be very careful as to expenses, I must say that we cannot follow that principle of mining which is very sound for people dispensing of a large capital in opening out mines, and which would be, to begin with, tracing the mine to a great depth. I have already mentioned that Polenta contains a great deal of water, and naturally the deeper you to have to pump it from the greater is that expense which constitutes the larger portion of our loss at Polenta. I made it, therefore, a peculiar point to carry the works only to such a depth that the tracing of the mine—that is, the making of the preparatory galleries and opening the headings—should cost the least possible sum as proportioned to the height of the fertile seam thus made available for the most economical working. This has been done at Polenta, and I am glad to say that the extraction of the mineral on a regular though limited scale has now been going on since May, though our galleries and search at our lowest levels have not yet reached that point where my observations warrant the assumption that the erosion made by the pre historic torrent will cease (there being still about 200 feet to travel). I have every reason to believe that this will be accomplished in three months from this day, and in the meanwhile our small present production, which is about 45 tons a month, will be kept up if not increased. I do not think I need add many remarks as to our conditions last year (1877) except this—that the sulphur trade (as I believe all other trades were) was very low indeed, the prices of sulphur having fallen considerably during the year. The fall on the medium price of black sulphur was 5s. 8d. per ton, and on refined sulphur (which is commercially a more important article) the fall was 6s. 7d. per ton; so that at the very least this fall took away from our profits last year 2984*l.* 12s. 8d. You will perceive that neither your board nor myself can do anything against this unfortunate fact, and, indeed, the fall between last year's prices and those current only three years ago is such that on our last year's production it makes a difference of 5442*l.* in our profits. It is useless to form any anticipations on the subject of a rise in the prices for the present year, and even perhaps for the year after; as, however, six years ago the prices were as low as they are now, and yet they managed to rise between that period and the present day, we can only hope that such will again be the case; and a strong movement I initiated in Italy for the abolition of the heavy export duty on sulphur, which greatly impedes its successful competition with pyrites, would if successful have the desired effect. In the meanwhile, partially by the very careful use of the works made and partially by the most scrupulous economy in our administration, and by some minor profits which did not exist before this day, I hope to be able to persevere in what my yearly reports clearly show—that is, a steady diminution in the cost of production, which will partially compensate for the fall in the prices. I will now proceed to inform you on the present state of our affairs. This year (1878) opened with threatening symptoms at our best mine—Boratella. A large landslip was threatening, and the utmost efforts were being made to postpone it as much as possible. However, at the beginning of this year it became apparent that the event could not much longer be postponed, and important works were carried on with the utmost energy to reduce the effects of a general landslip almost to nothing as to the steady continuation of a constant and regular output, and absolutely to nothing as to the permanent value of our property. I must, indeed, express myself very happy in having foreseen this event as far back as the middle of last year, and in having then put in hand the works alluded to. You will soon see why these landslips are unavoidable at Boratella, if you come to consider that the circumstances are such as to make it impossible to procure fillings at anything but a ruinous cost, so that the pillar and stall system is the only possible system of work left, while the wall or floor strata are so weak and apt to yield that after a certain number of years the swelling between the pillars becomes such as to disturb the equilibrium of the feet of the same. A similar landslip almost entirely ruined our Boratella Mine in 1872—that is, before I had anything to do with managing our mines—but the experience of this year proves that whenever the event is foreseen and appropriately met, the effects of it are reduced to nothing, and not only that, but it can subsequently be made beneficial in the shape of affording the possibility of gaining the pillars left behind. We cannot be blind to the fact that owing to the peculiar circumstances of the place, the landslip being instantaneous to such colossal force as to be comparable to a great geological convulsion, and also owing to the formation of an inconceivable amount of deleterious gases, chiefly carbonic acid, oxide of carbon, carburet of hydrogen, &c., which wholly disturb and impede all ventilation. The task for preparing for guarding against the effects and overcoming them when the landslip occurs is in my estimation the most difficult that can be laid before any mining engineer in the world, nor have I met with any task more difficult in all my professional experience. I am glad now to be able to rely on the fact of these difficulties having been overcome, as a practical guarantee to the conviction that we are up to this most difficult task, which conviction is the more gratifying to me as there can be no doubt as to the unavoidable repetition of periodical downfalls at Boratella, such downfalls having also taken place periodically at all the neighbouring mines owned by other companies, where they have invariably occasioned lengthy and complete stoppages, with great loss of plant, in the shape of shafts, &c., none of which losses have we had to deplore. Notwithstanding the landslip I have alluded to, our production in the first six months of the present year was 5325 tons of sulphur, which would already show a small increase on last year's production for an equal period, and I confidently anticipate that our production in the second half of this year will to no small extent exceed that obtained in the first half, not only because such a large convulsion as the landslip at Boratella could naturally not take place without leaving a trace, however small, in our production at the mine, but also because the production of Borello is constantly increasing, and will soon reach that maximum where it is advisable to stop for the present in order to let the profits on the sulphur got at this mine pay entirely for the kilns and galleries made this year, and leave a margin possibly to increase the profits at Boratella. Finally, Polenta only began to yield its small contingent in May, and beyond any doubt it will now continue to contribute for the rest of the year. I have much pleasure in calling your attention to a very satisfactory change which is beginning to be visible in the conditions of the fertile portion of the seam at Boratella, which change has fortunately long since been foreseen by me, and important works were being carried out not only to trace it, but also to make it available as soon as possible. You will no doubt remember what I said in former years, that our works at Boratella were placed on a narrow band, or ribbon, if I may so call it, of fertile area, running from south-east to north west, sided by barren rock to the rise and to the dip. This was the only fertile portion of the mine known before my time, and in fact the smallness of the width of this fertile band was only detected after the mine had become the property of this company. In 1874 I discovered another fertile area a considerable distance from the one just described, and ever since then works have been carried on, as you know, to connect this with the winding shaft, which happens also fortunately to be most efficiently provided with winding power. These connecting works have now been finished, but the new fertile area is not yet available, because the old working of past centuries, all filled with water, which have to be cut through, make this work a slow and difficult task. While this is being completed other works were put in hand to trace the point where we expected both the band of fertile mineral known to our predecessors, and the area discovered in 1874, thus having a very wide fertile area in front of us. This line has been traced at the beginning of July, so that we are now approaching a fertile area already traced to be nearly three times as wide as the one known before my time, and everything is in hand to make it available in such a way that the works of search should, as the hewing proceeds, gradually come in for wheeling or ventilating, so as not to invest eventually a shilling in search, however vitally important it may be to a miner to carry on his galleries of search, and be informed of his future, to have time to provide for unforeseen accidents. As I said, however, we can and actually do drive these galleries of search in such a manner as to make them a part and portion of works indispensible for the actual working of the seam. I need not point out that this discovery considerably enhances the value of our property, and improves our prospects for the future—at any rate, as to the probable amount of production. On the whole, I consider our affairs to be steadily though slowly progressing, notwithstanding the considerable difficulties which arise to make their progress slower, and which are independent of all possible exertions on our part. As for instance, the considerable fall of prices in the sulphur market, and the not less considerable impoverishment of the mineral at our principal mine, which facts, put together, cut off large sums for our would-be profits. We cannot lose sight of the fact, however, that we have now reached the point when no more investment is required at Boratella, and none after Sept. 1 will be required at Borello, which will regularly yield (with such plant as it will then have) 2400 tons per annum, unless something quite unexpected occurs, and Polenta will remain the only mine to be either brought up to the same productive and paying mark, or to be abandoned, according to what the works in hand will show. You will no doubt agree with me that for us, who never had any capital for developing and working our mines, the fact of having completed by far the largest portion of the development of the same is of the utmost importance, and leaves no doubt in my mind that after the outstanding liabilities have been progressively extinguished our dividends must show a yearly increase, as anyone carefully analysing the facts and cyphers placed before them as results of the last year's working will clearly perceive. To myself, as a shareholder who bought three-fourths of the shares I possess at 2*l.* premium, and I believe to every shareholder who has followed our course attentively from the beginning, it affords me much satisfaction to know that the value of our properties is now elicited; further, that working the mines instead of impoverishing them in the shape of reducing so much the total amount of mineral they were known to contain has led to the discovery of seams far more extensive than were known to our predecessors, and to us some time after we owned the mine; and again, that we are independent in all the divers phases of our production in which we were burdened with tributaries before; and finally, that our credit has been thoroughly re-established since 1874, when with the utmost exertions no money could be obtained for this company on better terms than those you know had to be paid to the Italian Sulphur Company. We have now raised as much as 8000*l.* merely on current account at our bankers in Italy, and surely everyone will admit that while credit is generally the barometer of the solidity of any concern, reacquired credit after such misfortunes as we have gone through immediately after the birth of our company is the most brilliant proof that your board could offer to you that we are steadily rising. (Applause.)

The CHAIRMAN said—Gentlemen, you have heard in full detail the position of our works, and I think that altogether you have no reason to complain though we

are not yet in a position to declare large profits amongst you. I have gone through the accounts of the last three years, and I find that during that time the amount of money that has been expended has been within a very few pounds every year the same, whilst on the other side with that expenditure we have had an increase of produce, and a very marked increase, and the managing director has already explained the reason why that increased produce has not been translated into larger profits—the depreciation in the price of sulphur, and the depreciation in the tenor of the mineral extracted—but the fact remains that with the same expenditure we have extracted a larger amount of mineral. Ever since Mr. Kossuth has taken the management of the mines into his hands he has adopted a principle which, though not immediately satisfactory to the shareholders, will prove satisfactory in the end. I hope, and that is to be preferred, to curtail the present profits in order to establish the works on such a footing as to give an almost certainty (a certainty so far as a certainty is possible in mining properties) that we shall have steadily increasing profits. Mr. Kossuth is the only member of our board who is a technical mining engineer, and however great might be the desire of the other members of the board to acquaint themselves with the works, they are simply men of business—they are not mining engineers, and, therefore, cannot tell you anything as concerns the works, or why new works are conducted, or whether they are carried out upon the very best principles. The only thing they can do is to watch fully and carefully the ultimate results translated by figures at the end of the year. I am satisfied that our property cannot be better managed than by Mr. Kossuth, and I think he will continue to command the confidence and the trust that every shareholder has in him. I now submit that the report and balance-sheet for the year 1877 be adopted.——Mr. J. STANIFORTH seconded the motion.

Mr. BARNETT asked if there was any definite time at which Polenta would be proved valuable or otherwise?——Mr. KOSSUTH replied that he thought the property would be pretty well proved by the end of this year. It would be very unwise to give up the mine before thoroughly testing it.

Mr. BONSOR said he had anticipated a better dividend than 1 per cent., and he wished to know what were the prospects of a better dividend at the end of the current year?——The CHAIRMAN replied that everything depended on the market for the sulphur and the tenor of the mineral raised. If during the past year they had had the same prices as they had in 1874 the profit would have been 5500*l.* more than it really was, which represented a dividend of 2 per cent., while the percentage of the mineral had fallen off 3 per cent.

The report and accounts were then unanimously adopted, and on the motion of the CHAIRMAN, seconded by Mr. STANIFORTH, the dividend recommended—2s. per share—was declared.

Mr. KOSSUTH, in reply to Mr. BARNETT, said he had now erected at Borello seven kilns, and the eighth, which was being built, would complete the required number.

On the motion of the CHAIRMAN, seconded by Mr. GOWLAND, the retiring directors, Messrs. L. Kossuth and Geisser, were re-elected; and on the motion of Mr. LYNCH the auditors, Messrs. Carter and Clay, were re-appointed.

The CHAIRMAN mentioned incidentally that the directors had waived their fees for some time, and intended to take no remuneration until they were in a position to declare a larger dividend.

Mr. BARNETT proposed a vote of thanks to the Chairman and directors, and to Mr. Kossuth, the managing director.——Mr. DEACON seconded the proposition, which was carried unanimously.——The proceedings then terminated.

THE AUSTRALIAN MINING COMPANY.

The thirty-third annual meeting of shareholders was held at the Guildhall Coffee House, on Monday,

Mr. HENRY COLLIER in the chair.

The SECRETARY read the notice convening the meeting, and the minutes of the preceding one, which were confirmed.

The director's report was then submitted, showing the progress of the company's affairs for the past year and the balance-sheet and cash account to June 15. The arrears of rent, due March, 1877, have been reduced by 225*l.* 10s. 6d. The year's rent, due March 25, 1878, was 2528*l.* 16s. 5s.—making total due 3673*l.* 15s. Of this the colonial agent had up to May 16 received 2778*l.* 17s. 3d.—leaving arrears at that date 894*l.* 17s. 2d. This result is satisfactory, considering that the harvest was generally unfavourable. The Charlton property (596 acres) has since December, 1876, been let to Messrs. Murray and Tinline, at the low yearly rent of 60*l.* Land in this locality is gradually being taken up for farms, and when the district become more settled, and the railway system extended, a considerably increased rent will be obtained; but, in the meantime, land is deteriorated in value for grazing purposes. The Port Augusta property, half an acre, continues let at 10*l.* per annum rent, the tenancy expiring Oct. 1 next. This port will, no doubt, have most of the trade of the northern districts—already steamers are plying to and from Port Adelaide, and large ships now load for Europe. There seems reason to expect that the company's land, having deep water frontage, will eventually command a good rent. The Olive plantation occupies 20 acres. It was intended to transplant from the nursery on Block 32 of the company's land about 2000 olive trees, which were grafted in 1876; but, the season proving unfavourable, the transplanting was postponed. At the date of last advices from the colony the land, however, was being prepared, and Mr. Davenport reports that the trees are in good order. A second lot was budded in December last, and will be ready for transplanting next year. The accounts show a balance in hand in London on June 15 of 284*l.* 7s. 2d. Since that date remittances have come to hand from the colony amounting to 2250*l.*—together 2534*l.* 7s. 2d. The dividends unclaimed amount to 507*l.* 17s. On Aug. 1 the directors propose to pay a dividend of 2s. per share.

The CHAIRMAN, in moving the reception and adoption of the report, said that he regretted that they could not have a half-crown dividend this year, because they had lost so much of the rent at Charlton. They used to get 200*l.* a year for that property, but now they received but 60*l.* The reason was a very simple one. When they got the 200*l.* the holding of the property gave extensive grazing rights; but a large number of other farms being taken up in the district the value of the grazing rights was proportionately diminished. Under these circumstances, he was afraid they could not look for any immediate increase; but when no unsold Government land was to be found there the rental would, no doubt, rise again. For Port Augusta they got very little, but their prospects were improving there; a railway had already been commenced, by which a distance of some 250 miles would be bridged over. This would form part of a system which would ultimately bring a large quantity of produce for shipment at Port Augusta, instead of Port Adelaide. The olive plantation was going on well; Mr. Davenport had just got in about 1500 trees, and if the weather continued favourable they would no doubt thrive. He regretted to have to inform them that their old chairman—Lieut.-Col. Geo. Palmer—felt himself no longer able to attend at the board, but he would not cease to take interest in the affairs of the company, and his son offered himself for election to the vacant seat. He concluded by formally moving the resolution, which Mr. F. COLLIER seconded.

Mr. DAVIS did not intend to oppose the resolution, but would remark that they must all be disappointed in receiving only a 2s. dividend; he would, therefore, ask the board whether they were quite satisfied that Mr. Davenport was really doing his best to get in the rents. It might happen that in order to get a good name out there he had been too lenient. If the tenants had bad years some allowance might be necessary, but all the loss ought not to be thrown on the company.

Mr. F. COLLIER said that the directors were quite satisfied with Mr. Davenport's exertions to get in the rents. He had always given the directors satisfactory reasons for the delay, reduction, or cancellation of any debt.

Mr. LEGG enquired why the accounts were made up to May 16 for the colony and to June 15 for London? He also thought that it would be desirable to give a statement of the rents received for the various properties, and the names of the tenants, as well as a list of any deductions made. He had every confidence in Mr. Davenport; but he thought the shareholders would like that information that they might judge for themselves.

Mr. F. COLLIER explained that as to the accounts they brought them down to the latest colonial date practicable. The directors were, of course, able to make the London account up to a little later date; but both had to be closed soon enough to enable the auditors to make their investigation, and report in time for the meeting. As to the names and amounts of the tenants he thought it would be very objectionable to publish such particulars, as they would be sure to get out to the colony, and would cause much unnecessary annoyance. As to the olive trees it was true that they had been desirous to get tenants to plant for themselves; but they had not succeeded in doing so, and, by Mr. Davenport's advice, they had made the experiment themselves. The planting had only been finished a day or two at the date of their last advices, so that they knew nothing of the result. When Mr. Davenport was in England he visited Spain, Italy, and France, and after careful enquiry had selected vines which he considered most suitable for their purpose. As to whether they would thrive and so on they at present knew nothing. An olive tree when properly established should produce from 5s. to 15s. per year, and they had 1500 or 2000 of them; but to make any estimate now would be much like reckoning chickens before they are hatched. They could only hope for a good result.

Mr. DAVIS enquired whether the directors had considered the practicability of paying dividends half-yearly?——Mr. COLLIER said as the rents were only received yearly this could not be done.

The report and accounts were then unanimously adopted; Mr. Henry Collier was re-elected a director, and Mr. George Palmer was elected in place of his father, Lieut.-Col. Palmer—Messrs. Gordon and Legg having withdrawn their candidature in his favour. Messrs. J. Grove, C. Ehrensperger, and T. White were elected auditors; and, thanks having been voted to Mr. Davenport, to Lieut.-Col. Palmer, and to the Chairman and directors, the proceedings terminated.

D'ERESBY CONSOLS MINING COMPANY.

A general meeting of shareholders was held at the company's offices, Gracechurch Buildings, on Tuesday,

Mr. J. Y. WATSON, F.G.S., in the chair.

Mr. C. B. PARRY (the secretary) read the notice convening the meeting, and the subjoined report of the agent was submitted:—

July 27.—In brief detail, as below, I give you a report of our operations since the commencement, which, as will be seen, have been for the most part of a preparatory nature, and also the present and future prospects of the mine. The deep adit level had been driven into the mountain a distance of 220 fathoms. The object of this level was to intersect a number of lodes (D'Eresby Mountain), which had been wrought on at surface, and as far down as they could go with the water, and which were exceedingly productive as far as they could be followed. Six of those lodes have been merely intersected, and were not worked on by the former workers for two or three reasons—till they had communicated with the shaft they had no air, and those lodes were considered of less importance than the ones nearer the shaft, and after the shaft had been communicated their capital had been expended. The fact of their driving this level at a cost of not less than 3000*l.* shows the faith they had in the mine, and I think still that their faith was based on sound common sense and reason, and that they were not following a mere chimera as some do in mining operations, although it may be difficult as yet to say what the result of a thorough exploration will be. We found this level partially choked, which we have now cleared up to the shaft, and have also laid a good substantial tramway to within 20 fms. of that point—a distance of 200 fathoms. We have not done much of an exploratory nature for want of the tramway to clear away the stuff. On the Gorse heading we have driven north (towards D'Eresby Mountain) about 5 fathoms. The lode is about 3 ft. wide, and has produced some beautiful stones of lead, but not sufficient to value. We have driven south on another part of this lode about 2 fathoms, where it is quite as wide, having in it more quartz, and letting out more water; and I should not be surprised were we to strike on a bunch of lead any day. We have driven on Owen's lode about 3 fathoms. When we started here the lode was pinched up to a mere thread, but now it has opened out 3 ft. wide, and a leader of blende has come in on the footwall, which I expect will be replaced by lead as we get under the rich bunch of lead they had in the workings alluded to above at surface. The principal lode that the former workers raised lead from is still about 30 fathoms in advance of the extreme end of this level (deep adit), which we shall drive to intersect as soon as possible, and when this is done we may expect to have opened out a splendid piece of ore ground. A shallow adit had been driven also by the old workers for the purpose of draining off the water from Owen's, as well as an east and west lode. This we have cleared out to the run of workings for the same purpose, in hopes that now the adit is driven and water running freely from the lode it would drain itself. As there is no water now running out of this level I believe it would be a very easy matter to sink down to the adit level. Looking at the future of the mine the fact of having so many lodes, nearly all having been proved to be of a productive character in D'Eresby Mountain, as well as in this mine, should encourage every shareholder to stick to his shares. The lode in No. 1 level at D'Eresby Mountain is as pretty a lode as anyone could wish to see, and will soon be on the boundary of this, when the level can be taken from them and continued on through this mine. I should confine our operations entirely to driving levels on the Gorse heading, Owen's lode, and on the east and west lode towards the Cobbler's—the result of which will, no doubt, be pleasing and satisfactory.—JOHN ROBERTS.

The CHAIRMAN said: This is a statutory and merely formal meeting, but the agent's report will show the progress made in the mine. You are probably aware, as old reports show, that large quantities of lead have been raised from several north and south lodes, as far as the old miners could go without pumping machinery. Then, about 30 years ago, a deep adit was commenced from the valley, and has been driven 220 fathoms, at a cost of over 3000*l.* A shaft has also been sunk some depth to ventilate this adit, and altogether not less than 10,000*l.* has been expended in permanent work of which the company have the benefit. The principal work of the present company so far has been in laying down an iron tramway in the deep adit, which has been done for nearly 200 fathoms. This adit has to be continued about 30 fms. further to intersect the Cobbler's lode, 20 fms. below where it was so rich for lead; and here we look for great results. In the report of an eminent mining engineer made in the year 1855 it is stated that the adit had been driven 40 fms. only, and he strongly advised its continuance to cut eight or ten lodes, and the result, he believed, would be a "compact and lucrative mine." Indeed, this engineer, who seems to have inspected at the same time other mines in the district, in his report, adds—"I cannot help expressing my preference for this sett" (Gwayliffian as it was then called). Of course, the discovery in D'Eresby Mountain, which immediately adjoins D'Eresby Consols, has added materially to its value since the date of that report. I would only say further that we have nearly 4000*l.* of capital intact, and that the greater part of it is on deposit at a joint-stock bank, and bearing interest.

A SHAREHOLDER enquired whether the drainage was effected by an adit, or whether pumping machinery would be necessary?

The CHAIRMAN said that the drainage would intersect the lodes more than 20 fms. deeper than existing workings. In former times the ventilation was very bad, and a shaft was sunk at great expense down to the adit to ventilate it, and a late company spent altogether nearly 15,000*l.* in this and other works on the mine, and expended all their capital without reaching the object in view—the Cobbler's lode. The present company had about 30 fms. to drive to intersect it; he could not, however, say what the expense would be per fathom, but not much, as it would be driven on an east and west lode.

A SHAREHOLDER enquired whether there was sufficient water for driving a water-wheel?——The CHAIRMAN said that there would be reservoirs at the top of the sett, which when put in order would, he hoped, give them water. Mr. Daukes had also a project for utilising the force of the water of the lake.

Mr. C. B. PARRY, in reply to an enquiry, stated that their adit was several feet above the level of the surface of the lake.

Mr. JEHU HITCHINS said that with a good wheel at the bottom of the lake and suitable machinery there was no reason why two-thirds of the water passing the wheel should not be elevated to that height.

The usual complimentary vote of thanks to the Chairman terminated the proceedings.

GROGWINION LEAD MINING COMPANY.

The half-yearly general meeting of shareholders was held at the Cannon-street Hotel, on Wednesday,—Mr. Ross in the chair.

The SECRETARY read the notice calling the meeting.

The CHAIRMAN said: Gentlemen, the report which we have placed before you to-day contains the abstract of nearly everything which I have to tell you, but I have no doubt you may wish to have some little exposition of our views, or rather our ideas, upon the present condition of the lead trade, and what the circumstances are which have resulted in the very low price of ore which we to-day in common with all lead miners so much regret. I need hardly tell you that the past six months has been a peculiarly anxious time for all producers of lead ore. The causes which have lead to the position in which the trade is at the present time are too numerous to be explained in the time we have at our disposal to-day, but I think we may summarise them to some extent by stating that they have mainly resulted in production running far ahead of consumption, entailing upon us, who are specially interested in this branch of trade, the privations resulting from economy and retrenchment. I am glad to be able to tell you to-day that there are abundant indications that the condition of things I have alluded to is almost at an end, and I think in a few months we shall see the trade once more on the road to the condition of two years ago. The history of the lead trade during the past few years, which it is necessary to be glanced at in order that the present position may be properly understood, is a particularly interesting one, as it shows that the high prices prevalent about the years 1875 and 1876, when pig-lead was 24*l.* per ton, resulted in increased production not only in England, but in all quarters of the globe where lead was produced to any extent. The first indication that producers had of a lull in the demand for our produce was the fact that some of our best customers were being stolen from us by the Americans, they having become, like ourselves, very large producers of lead, but not the lead which we have been in the habit of supplying almost the whole world with, inasmuch as their lead is not of the kind suitable for rolling or conversion into innumerable articles for which lead is commonly used. This plethoric condition of things induced the people who trade in lead here to bring their stocks down to the lowest possible point, and at the present time it is in such a position that I believe stocks were never lower than they are, and that the smelters in executing their orders at present send away their produce almost hot from the furnace. This condition of things cannot last very long, for trade will return into its old channels. I think it would be very interesting to you if I for one moment give you a comparison between the years 1872, when the lead trade and all trade was very flourishing, and the year 1877, which we may consider to be the declining point in the trade. In the year 1872 America took from us 170,000*l.* worth of lead, and in 1877 only 59,000*l.* worth. The decline has been in every year progressive since 1872. China in 1872 took 135,000*l.* worth, and steadily increased to 323,000*l.* worth, but in January, 1877, she only took 8135*l.* as against 40,000*l.* in the corresponding month of 1876. That, gentlemen, was the commencement of the Americans seeking to rob us of the Chinese trade, and from information I have received lately we are satisfied that the Chinese will not buy much more American lead, and we may hope to see them here again before long. I might multiply these instances, but it is scarcely worth while. All this condition of trade has resulted in bringing about the present very low price which we all very much regret, and inasmuch, as I have previously mentioned, the condition of trade is now brought into such a state we are weekly expecting to see a decided change, as the stocks in this country are now as low as they can be, and the imports from foreign countries have fallen off very considerably. We may, now that the Eastern difficulty is settled, expect to see a great revival in business. We can only regret that the amount standing to the credit of profit and loss is not greater than it is, but I think it is satisfactory to find that when many other companies have not been able to make any profit at all we have still a small amount to the good, which amount, I believe, in the next six months will be very much higher than at the present time. Having thus turned over what I may call the dark side of our report, I may refer you to Mr. Kitto's report, more particularly that paragraph which tells you that the explorations under the deep adit level have resulted in more discoveries. This being so, I think we can have no hesitation in regarding the future of our mine as assured for many years, because the deeper we go down the richer and stronger do we find our lodes. With regard to the accounts, they are in the form usually presented. There is no item which calls for any special remark, and therefore I will move the reception and adoption of the report and accounts.——Major SMYTH seconded the resolution.

The CHAIRMAN, in answer to Mr. Horsley, said the dividend received from the Bury Port Company had been 1s. in 1*l.*, and he heard it was possible that a further small sum would be paid.

Mr. KITTO, in answer to some criticisms and remarks by Mr. Horsley, said a very ample reason could be given why the expenses were apparently more compared with the returns than they were in the previous year. In the previous half-year they opened up 961 fms. of ground, but last half-year they opened 1139 fms., or 170 fms. more, to obtain the same quantity of ore, and as the opening up of each fathom cost 3*l.* 10s., that would fully account for the apparent increase in the expenses. He might fairly say that the price of lead ore had risen. That very day they had sold 100 tons of ore at 3s. per ton more than the previous sale, and it was an encouraging feature that all the smelters invited to tender had sent in tenders, whereas on the previous occasion only four sent in. The richness of the lodes had not fallen off, but was about the same as for some time past.

Mr. HORSLEY said that in making the observation he had done he had no intention of casting any reflection whatever upon Mr. Kitto, who, he believed, was the best man they could have as manager of the mine. He (Mr. Horsley) went on to say he was confident that if he were allowed to go to the mine he could effect considerable economies by consolidating the offices.

Mr. KITTO said they had only one office on the mine, and he did not see how much could be done in the way of consolidating that.

The CHAIRMAN said he did not for a moment suppose that Mr. Horsley could effect a single further economy, but at the same time he should be happy to give Mr. Horsley permission to visit the mine, and would present him with a first-class tourist's ticket to Aberystwith, and then Mr. Horsley could report to the next meeting, and the shareholders would be saved these long discussions, arising from well-meant misunderstandings on technical points of management.

The resolution for the adoption of the report and accounts was then put and carried.

On the motion of the CHAIRMAN, seconded by Mr. J. OWEN, a dividend of 10*d.* per share was declared on the old shares, and 6*d.* per share on the new issue.

The meeting was then made SPECIAL, for the purpose of considering the following resolution:—"The board shall be entitled to set apart and receive for their remuneration the sum of 125*l.* for each half-year, and when in any half-year a dividend after the rate of 5 per centum per annum shall be paid to the shareholders the board shall be entitled to 150*l.* for the next ensuing half-year; and when in any half-year a dividend after the rate of 7½ per centum per annum shall be paid to the shareholders, the board shall be entitled to receive for the next ensuing half-year 175*l.*; and when in any half-year a dividend after the rate of 10 per centum per annum or upwards shall be paid to the shareholders, the board shall be entitled to receive for the next ensuing half-year 200*l.* The minimum remuneration of the board to be at the rate of 250*l.* per annum, and the maximum amount 400*l.* per annum, unless a larger sum be voted by shareholders at a general meeting. The same to be divided as the board shall determine."

Mr. BOWMAN moved the adoption of the special resolution, and, speaking from a knowledge of the locality, reiterated the opinion which he had expressed at a former meeting, that the mine was a good property, and would eventually make much larger returns to the shareholders.——Mr. KERLY seconded the motion.

Mr. HORSLEY moved, and Mr. FISHER seconded, that the word 350*l.* be substituted for 400*l.*, but on a show of hands the amendment was lost, and the original resolution was then put and carried.

On the motion of Major SMYTHE, seconded by Mr. DAVEY, a cordial vote of thanks was passed to the Chairman, directors, and manager, and the meeting broke up.

WHEAL KITTY (ST. AGNES) MINING COMPANY.

The general meeting of shareholders was held at the company's offices, Austinfriars, on Thursday,

Mr. CHESTER CHESTON in the chair.

The accounts (charging seven months' cost against six months' returns, to April 31) showed a loss of 38*l.* 16s. 11d., and a debit balance of 506*l.* 19s. 6d.

The agents' report was favourable, and stated that the stopes and pitches still continue to yield the usual quantity of tin, but profits could not be made with the present low prices. The agents' report was read as follows:—

July 30.—Pryor's Lode: In the 154, driving west of new shaft, the lode is of a most kindly appearance, from which there is reason to expect an early improvement. The 154 east is without alteration since last reported on. In the 142 fm. level, driving east of shaft, the lode is worth for tin 6*l.* per fathom. In the 140, driving west of shaft, the lode is worth for tin 15*l.* per fathom. In the 94, driving west of shaft, the lode is worth for tin 8*l.* per fathom. In the 65, driving west of the shaft, the lode is worth for tin 7*l.* per fathom.—Old Lode: In the 100, driving west of the engine-shaft, the lode at present is disordered, but we consider this to be only temporary, and that it will shortly improve to its former value of 8*l.* per fathom. In the 90 the lode is worth for tin 5*l.* per fathom. The stopes and pitches continue to yield the usual quantity of tin, but no good can be done with the low prices we receive.—WILLIAM TEAGUE, STEPHEN DAVEY, RICHARD HARRIS.

PENHALLS MINING COMPANY.

The general meeting of shareholders was held at the company's offices, Austinfriars, on Thursday,

Mr. CHESTER CHESTON in the chair.

The accounts showed a loss of 202*l.* on the five months' working, and a debit balance of 642*l.* 8s. 4d. The company had sold 92 tons of tin, and a rise of 5*l.* per ton would have given a profit. The agents' report was read, as follows:—

July 29.—Since your last general meeting the north section of the lode at the 70 has been opened out some 15 to 16 fms. in extent, and has been found to vary in value from 5*l.* to 12*l.* per fathom. The east end at present being worth 5*l.* per fathom, and the west end 8*l.* per fathom; this level is only some 3 to 4 fms. below the fault referred to in our last general report, and so far the lode seems most productive in the bottom of the level, where the lode is getting more settled. Between the 60 and 70 at this point there are three faults, which have moved the lode some 5, 3, and 4 fms. respectively, and in opposite directions, hence the reason probably why the lode is somewhat unsettled about the 70. The 60 east end which was on the south part of the lode did not prove very productive; some three months since the north part of the lode was cut into by a short cross-cut, and the end continued on this part, which has varied in value from 6*l.* to 12*l.* per fathom. Throughout the eastern part of the mine those two parts of the lode are diverging, and appear as two distinct lodes for a long distance close by, and nearly parallel with each other. The 55 east end on another section of the lode is at present not very productive after having passed through several fathoms of good tin ground. In the western part of the mine there is nothing very good to notice; in each of the 45 and 48 ends the lode is small, and not of much value. The flat rod shaft now being sunk is at about the 50, when a plat will have to be cut; this shaft will meet with the Pink lode at about the 70, a little to the west of the tin ground found in the eastern part of the mine, in such a position as will greatly facilitate the development of this part of the property. The stoping department generally is not quite so productive at present as it has been owing to the exhaustion of one or two of the better stopes without as yet a corresponding improvement elsewhere; this however, we hope is only of a temporary character, and such as is often experienced in this mine, but is more acutely felt during the very depressed state of the tin market which now prevails than it would have been during the prevalence of average prices.—S. BENNETTS, P. VIAN.

BLUE HILLS MINING COMPANY.

The general meeting of shareholders was held at the company's offices, Austinfriars, on Thursday,

Mr. CHESTER CHESTON in the chair.

The accounts for five months—to May—showed a loss of 360*l.* A call of 4s. per share was made. The agents' report, which was as follows, is encouraging:—

July 29.—In furnishing you with our report of progress made in the various points of operation since your last general meeting, we notice first the Pink lode, which has been opened on east by the 80 at the engine-shaft 16 to 17 fms. Throughout this drivage the lode has varied from 2 ft. to 6 ft. wide, and more or less tinny. For some 3 fms. in length it yielded ¼ ton per fathom. In the present end, which is 7 fms. east of the most productive point, it is 3 ft. wide, worth 4*l.* to 5*l.* per fathom. The shaft is sunk below this level in the killas by the under wall of the lode about 5 fms. The south portion of the lode only is seen here, which is producing low quality tinstuff. The top lode is found 9 fms. to the north of the Pink lode, and is opened on by the same level east and west about 20 fms. The whole of this drivage has been through tin ground varying in value from 4*l.* to 12*l.* In the west end the lode is worth at present 5*l.* per fm., and in the east end 12*l.* per fathom. This lode so far as opened out has not been found to exceed in width 1½ ft., and rarely so wide, but whether its width be 1 ft. or an inch it is generally rich in tin of the finest quality, and according to present appearances is likely to be the most productive of the two as it leaves the Pink lode eastward. On the north lode the 30 has been further extended eastward 15 fms.: 3 fms. of this drivage was through good tin ground, worth 15*l.* per fathom. The last 6 fms., however, although producing low quality tinstuff, has not been of much value, until lately it seems to be again showing signs of improvement by occasional patches of good tinstuff. The Blue Barrow shaft has

been sunk below the adit on this lode 12 to 13 fms., but as the shaft is still some 20 fms. in advance of the 30 east end the sinking of this shaft has been suspended until the end is further advanced, which end is being pushed on as fast as possible by a full pare of six men at the rate of about 1 fm. per week. For the future development of the mine, in addition to the points above noticed we think the engine-shaft should be sunk as fast as possible to another level (say, 12 fms. at least on the course of the lode), as there is every probability of the 80 being just getting down on the tin ground below those series of faults found about the 60 and 66. The whole of the deposits of tin hitherto found in this and adjoining mine have an eartery dip, hence our abiding and very strong opinion of this part of the property in depth is that it contains a good and lasting mine.—S. BENNETTS, P. BENNETTS.

COLORADO UNITED MINING COMPANY.

The annual meeting of shareholders was held at the Cannon-street Hotel, on Thursday,

Sir CECIL BEADON, K.C.S.I., the chairman, presiding.

Mr. F. ANDREWS (the secretary) read the notice calling the meeting.

The CHAIRMAN said: Gentlemen, the reports and circulars which have been issued by the directors since the commencement of the year are so full of information that I really have very little to tell you. There are no facts to tell you which are not already recorded in the documents which I hold in my hand, and which you are in possession of. When I last had the pleasure of addressing you I was able to inform you that the arrangement with Messrs. Chaffee and Hamill, whereby the company acquired a property consisting of 58,000 ft. of mineral lode, had been completed. We commenced operations upon the united property at the beginning of the year now under review. I need not tell you that, in consequence of the enforced suspension of operations for two years previous, the mine had fallen into a state of very considerable dilapidation, and when we had to commence operations again a great deal was necessary to be done, not only for making developments for future working, but in repairing the damages which time and enforced inactivity had occasioned. I told you at the last meeting that we had considerable difficulty in getting from our agent, Mr. Henty, any reliable accounts or any intelligible reports as to the condition of the mine and the state of our business. This went on for some little time longer, and we were at last obliged, very reluctantly, to come to the conclusion that we must dispense with Mr. Henty's services, and, therefore, we engaged the services of Mr. Morgan, who has been employed at the mine eight months, and who, so far, has given excellent promise of what he will be able to do for the company. I may mention that Mr. Andrews again kindly volunteered to go out to America to put things right, and to install Mr. Morgan in his office. Mr. Andrews remained there about four months, and I think the affairs are now in a good condition as far as the management is concerned. I must do the justice to Mr. Hamill, one of our large American shareholders, and the gentleman from from whom we purchased a portion of the property, to say that when Mr. Henty, owing to some infirmity, showed signs of incapacity for attending to business, Mr. Hammill stepped forward and took upon himself the management of the mine, and we are very much indebted to him for his interference and for preventing things getting into a worse state than they were actually in. I will say a few words with respect to the present position of our mine. We have acquired what I believe to be a property of enormous value, which only requires time and expenditure to develope. We have, as I said before, 58,000 feet of superficial mining ground, and we have every reason to think from the developments which have taken place that as we go further into the mountain and deeper into the ground the apparent value of the mine will be very considerably greater than it now seems to be. You must remember that up to the present time we have only got to a depth of 400 feet or 500 feet below the level of the original discovery shaft of the Terrible; so even taking that depth we may consider we have as yet only scratched the surface of the ground, because we can go several hundred feet deeper and still be able to take out the rich ore which presents itself at a considerable profit. Then we have the Union tunnel, which is driven in at the Creek level, which is about 500 ft. below the original discovery shaft, and from this point we can commence further sinking operations into the earth. The silver ore tunnel, which was commenced by Messrs. Chaffee and Hamill before the property was ours, is being driven into the mountain, and we are daily expecting to hear it has struck the Brown lode, or the group of lodes of which the Brown is one, and which are supposed with considerable reason to unite at some point not very far below the point at which we shall strike them. I think the future of our property will depend in some degree upon the result of these borings; we have now gone in 1000 feet. It was supposed by the survey which was taken that we should strike the Brown lode at about 950 ft. We have gone nearly 1000 feet without having struck it yet, but that in my mind, and in the opinion of experts, is rather a favourable circumstance, because it shows that the Brown lode dips inward into the mountain, where we know the lodes meet, instead of dipping outwards, and it shows that the point where the junction of the lodes occurs is nearer the surface than what we originally thought they would be found. The silver ore shaft has been sunk to the point at which it has struck the eighth level of the Terrible Mine, and at the same time the Union tunnel driven into the hill has effected a junction with the silver ore shaft, which is driven perpendicular to about the 8th level, which is being drifted from the engine-shaft. The reports which the agent gives us of the condition of the mine at these points is very satisfactory, and, as you will see by the report, he anticipates from one stope alone, which is 150 ft. long and 80 deep, he will get mineral worth 50,000*l*., and there is every reason to suppose the other two stopes which are being developed will be quite as valuable, or nearly so, so I think our prospects for the coming year may be regarded as favourable. At the point where the silver ore strikes the 8th level a drift is being made to meet the drift on the 8th level, which is being driven from the engine shaft, and as we go along the indications of rich mineral continue to be as fine as in the upper levels, so there is every reason to hope the anticipations of the agent with respect to the productive character of that part of our mine may be realised. You will see by looking at the accounts that the result of our working during the past year shows a gross return of 28,758*l*., on the other hand we spent 35,195*l*., of which, according to the accounts, 8293*l*. is deducted on account of permanent work, and debited to capital, and the remainder is current expenditure. But a great deal of that money which has been expended on what is called current account is really due to development, because a great deal has been spent, I am afraid under the former management not very judiciously spent, upon drifting along the line in search of ore, and in a direction in which the prospects of fine and rich ore hardly justified the expenditure. All that expenditure has now been stopped, and we are now concentrating our efforts upon that part of the mine which is shown to be rich and profitable, or rather on developments in the direction which may bring us into good ground. In the east it must be left until we are in a little more prosperous condition. We had a balance in hand from last year to the credit of profit and loss, which has enabled the company to wipe off some of the bad debts with which the company was unfortunately burdened, and to carry 798*l*. to the property accounts. Our property, as you will see by the balance-sheet, stands at present at 313,631*l*., and we have a few little assets besides, such as sundry creditors and so on, and we are liable to the shareholders for 305,000*l*. We are in debt in Colorado to the extent of 6295*l*., of which 2747*l*. is the amount due to Mr. Hamill, which is susceptible of some reduction—not a very considerable reduction, but some reduction; and I may inform you that by the operations of the first two months of the present year—namely, April and May—we have reduced that debt by the amount of some 2000*l*. or 3000*l*., and probably by the operations of July we shall reduce it some 2000*l*. more, so that at the end of the present month we may hope we shall be entirely out of debt, and be able to commence operations and obtain a profit. We have also, under the authority given us by the special resolution passed last year, offered to the shareholders the remaining balance of the unused capital, amounting to 4000 shares. The market price of the shares having risen something between 6*l*. and 7*l*., we thought it fair to the shareholders to offer them to those who wished to take them at par. In response to that call we have received applications for about 600 shares, which will give us 300*l*., which will be strictly set apart for any future outlay which may be necessary upon capital account so as to enable us to realise from our current operations the full amount of profit which they are calculated to give. Of course, gentlemen, you are all aware that the price of our shares in the market is regulated by circumstances over which the directors have no control whatever. I may just allude to one circumstance which affects the present position of the mine, and that is the completion of the dressing works. They have cost a great deal of money—I believe not much less than 5000*l*., but certainly over 4000*l*., but I expect the figure is not much less than 5000*l*., and they are worth that. There has been great delay in their completion, owing to the failure on the part of the people at Chicago who supplied the machinery. There has been great delay in getting the mill ready, but we are now advised that it has commenced operations, and the superintendent expects, now it is in work, to realise from it a profit of 1000*l*. a month. We have on the dump, as it is called, and stored outside the mine and in the levels, an enormous quantity of low grade ore, which will provide employment for this mill for at least a twelvemonth, and every day, as our mining operations go on, this dump is increased in quantity. So far a considerable time—probably not less than two years—we shall have full employment for our mills. He then read a letter received from Mr. Morgan, under date June 4, and concluded by moving the adoption of the report and accounts.

Mr. W. J. ALT seconded the motion, and in doing so said: Looking at the vicissitudes through which the company had passed since it last paid a dividend, he thought their present position called for general satisfaction. They were all aware what litigation was in any country, and in the United States especially; and the fact that they had succeeded in getting through the lawsuit, and of bringing the company to its present state, could not but be looked upon with satisfaction. Without endorsing all the anticipations formed as to the value of the discoveries made, he thought they might safely consider that they had a most valuable property. It was not a mine of pocket deposits, but one in which the mineral was found in fissures, which he believed they had only to follow to get very good returns. He had studied the condition of the mine to some extent, and having considerable knowledge of mining in general, it appeared to him that it was only a question of spending a small amount annually in dead work, commensurate with the profits that may be made, and for which a reserve fund should be set aside to ensure this being a regular heirloom for those who possessed shares in the company. The property was of such an extent that it would be very difficult to say when it would come to an end. Under all the circumstances, he thought the shareholders would agree with him that there was matter for congratulation in the position at which the company had arrived.

The CHAIRMAN added that he should have called attention to the paragraph in the report which stated "The present returns from sales average for May and June 3200*l*. per month, and now that the concentration works are started it is expected that there will be an increase of at least 1000*l*. a month, there being about a year's supply of low-grade ore mined and awaiting concentration. The superintendent states that expenditure on permanent improvement account, with the exception of Silver Ore Tunnel, has now nearly ceased, and estimates his future expenditure at 2000*l*. a month." If these anticipations were realised they would have a profit of 24,000*l*. for the year, which would be 8 per cent. on their capital. The latest letter from the superintendent stated that the mine was looking very well, and the 8th stope splendidly. He stated that there was 8 in. of solid mineral in the bottom of the Silver Ore shaft, and a telegram since received stated that the mill was now at work.

Mr. SMYTH referred with great satisfaction to the position which the company had attained. The mine was now unencumbered, and the prospects of improvement in depth were of the highest character. Of course work did not commence before the end of January, and as the accounts were made up to March 31 only much ore could not have been taken out in that interval, but a great deal of work had been done since that date. Unlike the case of a great many mining companies, this company had taken no credit for the large amount of ore on hand, which would represent a very large sum of money. The mine was not in limestone but in granite, and he believed it would prove to be one of the most valuable properties in the world.

The CHAIRMAN exhibited plans of the workings, and explained to the shareholders the course of the operations which are being prosecuted.

The CHAIRMAN, in reply to Mr. Staples, said Mr. Morgan, the present manager, came to them with the highest possible recommendations, and with testimonials from persons of the highest character.

The report and accounts were then unanimously adopted.

The CHAIRMAN proposed the confirmation of the election to the board of Messrs. A. Holtz, W. J. Alt, and W. Fraser Rae. The shareholders would remember that in the agreement with Messrs. Chaffee and Hamil it was agreed that they should have the nomination of three directors; but it reflected great credit on those gentlemen to leave the selection of their nominees entirely in the hands of the board. They had had much pleasure, therefore, in electing the gentlemen he had named, who were doing everything possible to promote the interests of the company. Mr. Rae had gone to America, and had promised to go into the affairs of this company thoroughly, and report upon his visit to his colleagues.——Mr. PEARCE seconded the proposition, which was carried.

On the motion of the CHAIRMAN, seconded by Mr. COLVIN, Messrs. Montresor and Harris were re-elected directors.

On the motion of Mr. SMYTH, seconded by Mr. W. WARD, Messrs. Colvin and Marshall were re-appointed auditors, the CHAIRMAN, in introducing the motion, having stated that those gentlemen had kindly audited the accounts of the company during the past four years without any remuneration whatever.

A vote of thanks was subsequently passed to the auditors on the motion of the CHAIRMAN, seconded by Mr. J. COOPE DAVIS.

The CHAIRMAN, in answer to Mr. ASTON, said the directors had power under the Articles of Association, and under a special resolution of the shareholders, to dispose of the unallotted shares as they thought best in the interest of the company, but he thought it would be to the disadvantage of the company to allow the shares to go at any price below par.

On the motion of Mr. COLVIN, seconded by Mr. WARD, a vote of thanks was passed to the Chairman and directors, which the CHAIRMAN acknowledged.

A vote of thanks was also passed to Mr. Andrews (the secretary) for his visit to the mine and his assiduity in the general interests of the company, the compliment having been proposed by Mr. HARRIS, seconded by Mr. HOLTZ, and supported by the CHAIRMAN and by a SHAREHOLDER.——Mr. ANDREWS having briefly returned thanks, the meeting terminated.

A GREAT COPPER MINING ENTERPRISE IN TENNESSEE.

We print below an interesting sketch of the great copper mining, smelting, and refining works at Ducktown, Tenn. It was furnished by a scientific gentleman who is thoroughly conversant with his subject, and will be found of interest to all who are engaged in the metal trade, and especially to those who contemplate investing in southern mineral enterprises:—

THE DUCKTOWN COPPER MINES.

The copper belt upon which is located the Ducktown mines is situated in the extreme south-eastern portion of the State of Tennessee, in the county of Polk, and about 40 miles east of Cleveland, the nearest railroad outlet. Copper was first discovered there about the year 1849, it being found upon or near the surface in large quantities and of a superior quality, yielding on an average 25 per cent. of fine copper. Capitalists, hearing of this valuable discovery, soon flocked in and invested heavily in mineral lands containing the seemingly inexhaustible supplies of black oxidised ores. The result has been the building up of an industry among the mountains of Tennessee that is creditable and worthy of the energy and capital expended on it. Immediately after the opening of the old Hiwassee Mine the public excitement became so intense that quite a number of mining companies began to open and develope the various mineral lands in the locality, and in a majority of the mines rich ores were found in abundance, often producing as high as 40 and 50 per cent. of copper. These ores were simply dressed, then packed in boxes and transported in wagons to Cartersville, Ga., a distance of some 80 miles, and thence by railroad to Savannah. From there they were taken by steamer to the Baltimore Smelting Works at Baltimore, where they were carried through the various processes of roasting, smelting, refining, &c., before the copper was ready to be put upon the market. Although the mines were exceedingly rich, for the want of the necessary smelting facilities, costly and difficult transportation and other drawbacks, the greater part of them lost money, became discouraged, and were finally obliged to suspend operations. Somewhere about the year 1856 a nearer communication with railroad was effected at Cleveland, Tenn. (40 miles distant), rendering it much more practicable to ship the ores to Baltimore by the E. T. V. and Georgia Railroad (*via* Lynchburgh, Va.) In the year 1858 several mines consolidated and were incorporated as the Union Consolidated Mining Company of Tennessee. The history of mining operations at Ducktown has proved beyond a doubt that it is one of the most valuable copper mining regions in the United States. At present Ducktown employs, directly and indirectly, about 1000 men, and from the great activity displayed throughout all the various departments of the business, as more especially seen in the active operation of the many furnaces, the large amounts of ore roasting in the yards, trains of cars heavily laden with ore, &c., constantly arriving from the mines, one might easily be led to suppose that the price of copper had really advanced to its former market value.

The principal mines owned by the company are the East Tennessee and Mary. The former is over 600 ft. in depth, and the latter about 200 ft. Both mines are furnished with all the necessary hoisting and pumping machinery of the very best description, and are turning out hundreds of tons of ores every month. As the mines are some 2 or 3 miles from the company's smelting works the ores have to be transported this distance, which is accomplished by a narrow-gauge railroad, the power being furnished by two locomotives, all owned by the company. The quality and class of ores that are now mined differ, as a general thing, from those taken out during the past, in that they are now mostly of the yellow sulphuret class, which are not nearly so rich in copper as the black oxides. The latter being found upon or near the surface, and above the vein containing the former, have now been mostly worked out. The vein of copper ore (yellow sulphuret) now being mined varies in width from 15 to 60 ft., and seems to be inexhaustible. It averages about 6 per cent. of fine copper. The shafts are constantly being sunk and the drifts extended in good solid ore, the faces of the slopes generally presenting a most encouraging appearance.

Every department of this concern is carried on upon thoroughly scientific principles as well as practical knowledge, and the best of talent is employed. The smelting works of the company are situated about 1 mile from the East Tennessee Mine, and 2½ miles from the Mary Mine, being connected, as before mentioned, by the railroad. They comprise 16 blast furnaces, two calcining furnaces, two reverberatory furnaces for making pig copper, and one refining furnace, the capacity of which, when fully supplied with material, would be equal to 250,000 lbs. to 300,000 lbs. per month. From this furnace the ingots, slabs and bars are produced ready for market. The blast for these furnaces is supplied by two large and powerful blowing engines. Besides, there are numerous other structures, such as dressing works, machine shops, charcoal houses, matte sheds, ore sheds, &c. A large store is also owned and controlled by the company, containing goods of every description, and in which the employees do their trading. The fuel used is entirely charcoal and cordwood. The charcoal is required for the blast furnaces, roast piles, making brasque, &c., and is brought to the works by contractors, large quantities being received every day. The cordwood is chopped by contractors along the banks of the Ocoee River, at some distance from the works, and after lying awhile so as to become properly seasoned, is floated down the river until its course is arrested by a pontoon bridge, erected by the company for the purpose, and designed for catching the wood and holding it until it is taken out. The boats composing the bridge and over which the roadway is carried, are held in their places by strong steel wire-ropes. From the bridge to the company's railroad is only a short distance. Many thousand cords of wood are required every year. It is used for roasting the ore and matte, firing the reverberatories, refinery, calciners, locomotives, boiler of the blowing engines and of the various hoisting and pumping engines about the mines. Had the present economical management been brought into play during past years this would have been one of the largest mining countries in America. The people should appreciate the public spirit and enterprise, as shown by the present company, in building up on a permanent basis an industry that gives employment to hundreds of people both here and elsewhere. Nine-tenths of the business is done on contract, and those who will work get liberal pay for their labour. Many of the employees have been furnished with constant employment for nearly 20 years, and never has there been any of those difficulties and troubles between capital and labour that have so thoroughly shaken other portions of the country.—*Chattanooga*, June 21.

— *The Iron Age* (New York) July 4.

FOREIGN MINING AND METALLURGY.

Allusion has been already made to the strike at the Anzin Collieries, and it has certainly been the prominent feature for the moment in the French coal trade. The Anzin Company produces annually 2,000,000 tons of coal from its seven centres of working, and anything which affects its operations is obviously of rather wide spread interest. The direction of the company has issued a statement in which it contends that it has done its utmost to promote the general welfare of the company's employees. The statement observes that since 1874, when the industrial crisis still prevailing is assumed to have commenced, the administration has deemed it right not to reduce the extraction, but to continue to give steady employment to the working staff. The wages paid have ranged from 2s. 10d. to 3s. 8d. per day, and the company further states that it expends upwards of 52,000*l*. annually for the promotion of the moral and material welfare of its workpeople through the medium of gifts of coal, schools, a medical service, pensions, lodgings, &c.

A formidable strike which has occurred at the Anzin Collieries, in the North of France, has given a little stimulus to the Belgian coal trade, and the unexpected demand has had the effect of reducing stocks to some little extent. But this is, after all, only the temporary result of a cause which has already partly ceased to have any effect. In Belgium itself the consumption of coal presents some feebleness; the iron trade moves on only sluggishly, and nothing can be said to have occurred to improve the aspect of the coal markets.

Contracts have just been let by the administration of the Belgian State Railways for a quantity of rolling stock required for that system. The Dyle Workshops Company submitted the lowest tender for a lot of 15 first-class passenger carriages, offering to supply them at 448*l*. per carriage. Six firms, all Belgian, obtained orders for about 60,000*l*. of plant to be delivered as soon as possible. As these firms were in great want of work, the State was enabled to let the contracts upon advantageous terms. The authorities of Namur are endeavouring to induce capitalists to undertake the construction of a network of tramways in that city. A bridge is about to be constructed at Liége over the Meuse between the Boulevard Savoy and the Rue de la Regence. The Sclessin Company has undertaken to construct this bridge for 8983*l*.

The French iron trade has presented no material change, and no important alteration is now anticipated for the remainder of this year. There are no symptoms of improvement upon any of the markets. Belgium has been selling some descriptions of iron upon the French markets at 4*l*. 12s. per ton. The Germans are restricting their production, as they do not readily find outlets for it. In the French department of the Nord the iron markets remain at about their former level.

In connection with railway matters, it may be noted that a contract is about to be let for an iron bridge over the Save at Brod. The bridge will be about 1000 ft. in length. It occurs on a railway 66 miles in length, which is about to be carried out on the military confines of Slavonia and Croatia.

A letter from Dortmund says that the process of half-yearly balancing in the German iron and steel works is now complete. The results are more satisfactory than at the end of 1877, though they still leave much to be desired. In the best cases a small profit is shown; in others the expenses have been covered, but in many there is a deficiency on the six months' working. In a few establishments more activity has lately been apparent, and considerable contracts are in hand for the immediate future. The Bessemer steel works are especially well employed and the iron girder works also. The manufacture of steel-iron has also latterly expanded. Several works have important commissions from Russia. The chain-making works are better employed. The managers, however, have little faith in a continuance of the present favourable conjecture. An advancing tendency of prices for German Bessemer pig-iron has recently been manifested, and many of the Bessemer rail-rolling works have, therefore, made contracts with English producers for the supply of future requirements from this country. Sheet-iron has advanced five to six marks within the last week or two.

GAS MOTOR ENGINE.—According to the invention of Mr. F. KINDERMANN, of Neustadt, Magdeburg, a cylinder open at both ends contains two pistons, the rods of which extend in opposite directions, and have cross heads working in guides and connected to the ends of sway beams carried by the framing, the other ends of which beams are connected by rods to opposite cranks on the engine-shaft. The pistons are so arranged that at the end of their instrokes they meet at the middle of the cylinder, which has at this point ports governed by a rotary slide, having suitable passages and connections to a gas and air supply, whereby a combustible charge of gas and air is first admitted between the pistons, then ignited by a gas flame, and after the combustion has taken place the gaseous products are allowed to escape. The rotary slide receives a continuous rotary motion by means of bevil gear and a counter shaft from the engine-shaft. In operating with this engine the engine-shaft is first turned, so as to cause the two pistons to move away from each other somewhat, whereby the combustible charge is drawn in between them. On the ignition of this charge the two pistons are propelled in opposite directions, thereby imparting motion simultaneously through the sway beams, connecting rods, and opposite cranks to the crank shaft. The return stroke of the pistons is effected by the atmospheric pressure acting against the partial vacuum formed between the piston by the expansion and cooling of the products of combustion. By the above means the whole motive power produced by the combustion of the gases is transmitted to the engine-shaft.

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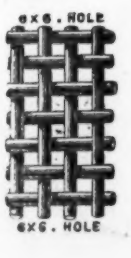

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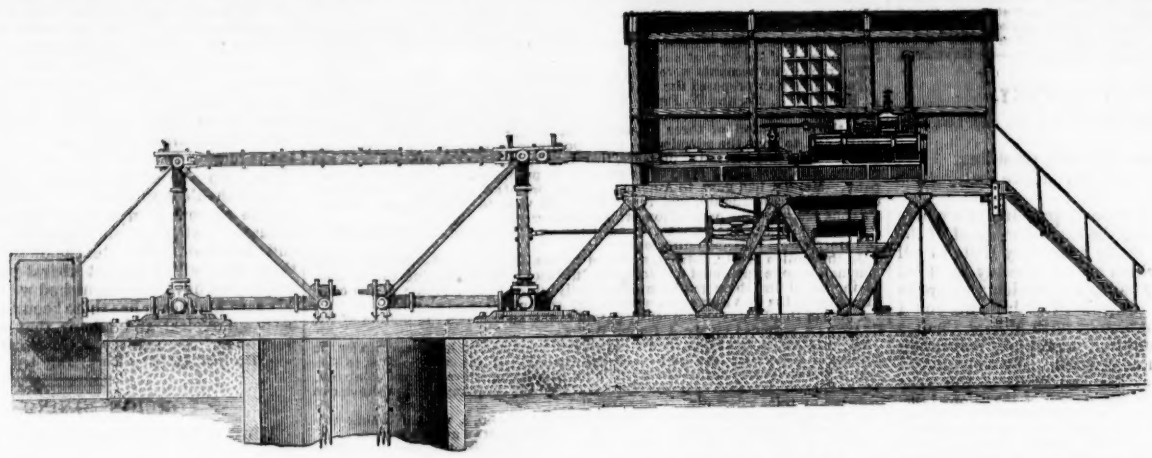
PORTABLE PUMPING ENGINES FOR SINKING PURPOSES.



PORTABLE PUMPING ENGINES FOR SINKING PURPOSES, &c.

MESSRS. HATHORN, DAVIS, AND DAVEY, ENGINEERS, LEEDS.

We illustrate above an engine specially designed for temporary and sinking purposes requiring no masonry foundations, but entirely self-contained on a timber or iron framework, readily taken to pieces and put together again. In practice it is found much better to use simple temporary plant for pumping during sinking operations, instead of putting down the permanent plant to begin with. The quantity of water to be dealt with is generally an unknown quantity, and often far greater than it would be advisable to put down permanent pumping plant for. It is necessary in sinking to work the pumps on air, or, as the miners call it, "in fork," to keep the sinkers clear of water and allow them to proceed with their work.

Mr. Davey has designed the engine above illustrated to meet those requirements. The engine is capable of working with very high pressure steam, which may be supplied from a portable boiler, and all the strains throughout the structure are in the direct line of thrust taken by the trussed framing which abuts against the heel of the quadrants. All the strains are thus resisted within the structure itself, and it may safely be erected on a heap of rubbish, only solid enough to support the weight.

A very powerful engine of this design may be erected and put to work in a few days. The makers propose to send out the engines and framing after having been erected in the works, and all accurately marked, so that it could be erected without delay.

Messrs. Hathorn, Davis, and Davey have lately supplied an engine which has been erected in this manner to the Lindall Moor Mines. After it has done its work at the present pit it will be removed to another. The engine is at present working 15 lifts.

For foreign mining these engines are especially suitable, as they offer such facilities for transport and erection.

JOSEPH FENTON & SONS,

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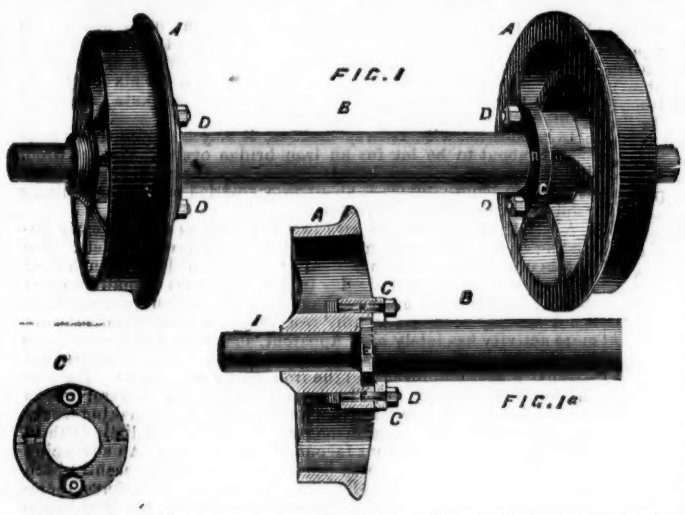
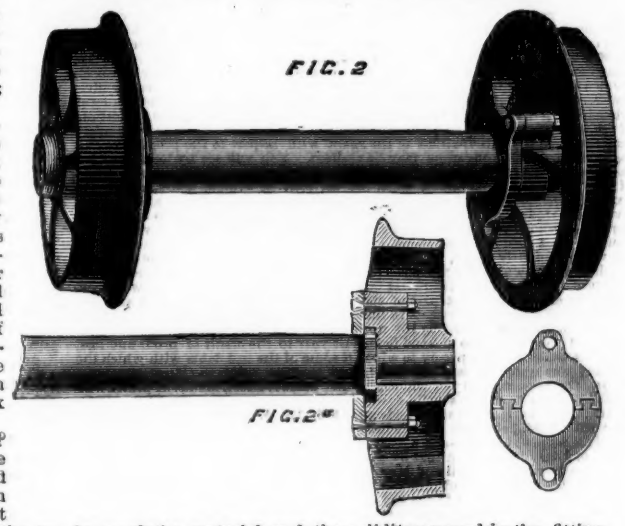
A New Patent Method of Fitting up Wheels and Axles.



Figs. 1 and 1a show a longitudinal view and plan of a pair of corf wheels and axles fitted up for outside bearings, and Figs. 2 and 2a for inside bearings. A A, are the wheels; B, is the axle; C C, the washers; D D, the bolts; E, the collar on axle B; and F, the recessed boss in the wheel.

The wheel is cast with a recessed boss in the inside, made to any shape, corresponding in shape and depth with a collar formed on the axle, which is forged of solid steel; the axle is secured into the recess partly by being sufficiently tightly fitted to require driving home with a hammer, and partly by the washer. Around the axle adjoining the boss is fixed the washer, made in two parts and dovetailed, so as to allow of being fixed after the collar has been forged on the axle. The washer is secured to the boss by bolts and nuts, both in outside and inside bearings; in the case of inside, by means of lugs cast on the boss, and the washer made of corresponding shape; the washer is made of crucible cast steel. The only tool required for fitting is an ordinary spanner for outside bearings, and a box spanner for inside bearings.

Now what are the advantages of this method? You secure a simple way of fitting—it can be done by anyone who has seen it—the only tool required being a spanner; the wheels can be detached from or secured to the axle in a few minutes. The next



advantage is the perfect solidity attained, the wheel and axle practically becoming as one piece. The durability results from the toughness of the material, and the solidity secured in the fitting. Another thing is the wheels do not need to be put in the fire to detach them, as is the case in ordinary wheels. (N.B.—Our wheels cannot be injured by being heated and plunged into cold water. which would render other steel wheels perfectly brittle as glass.) Saving in fuel and wages is evident—no skilled labour being required to refit wheels in case of a strained axle. By adopting this system colliery owners may save hundreds of pounds sterling yearly.

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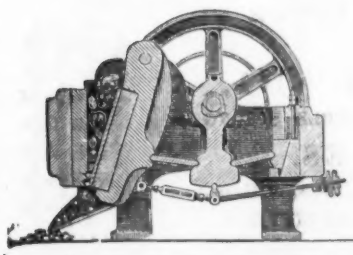

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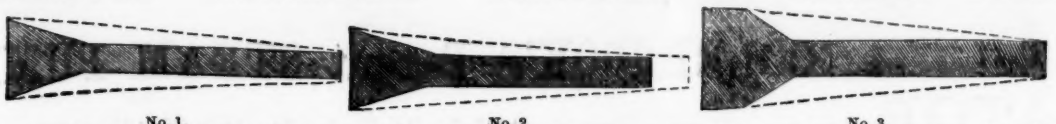

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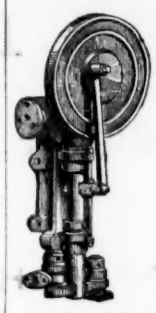

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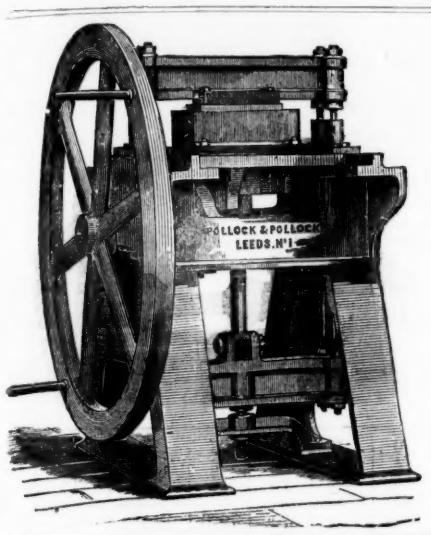

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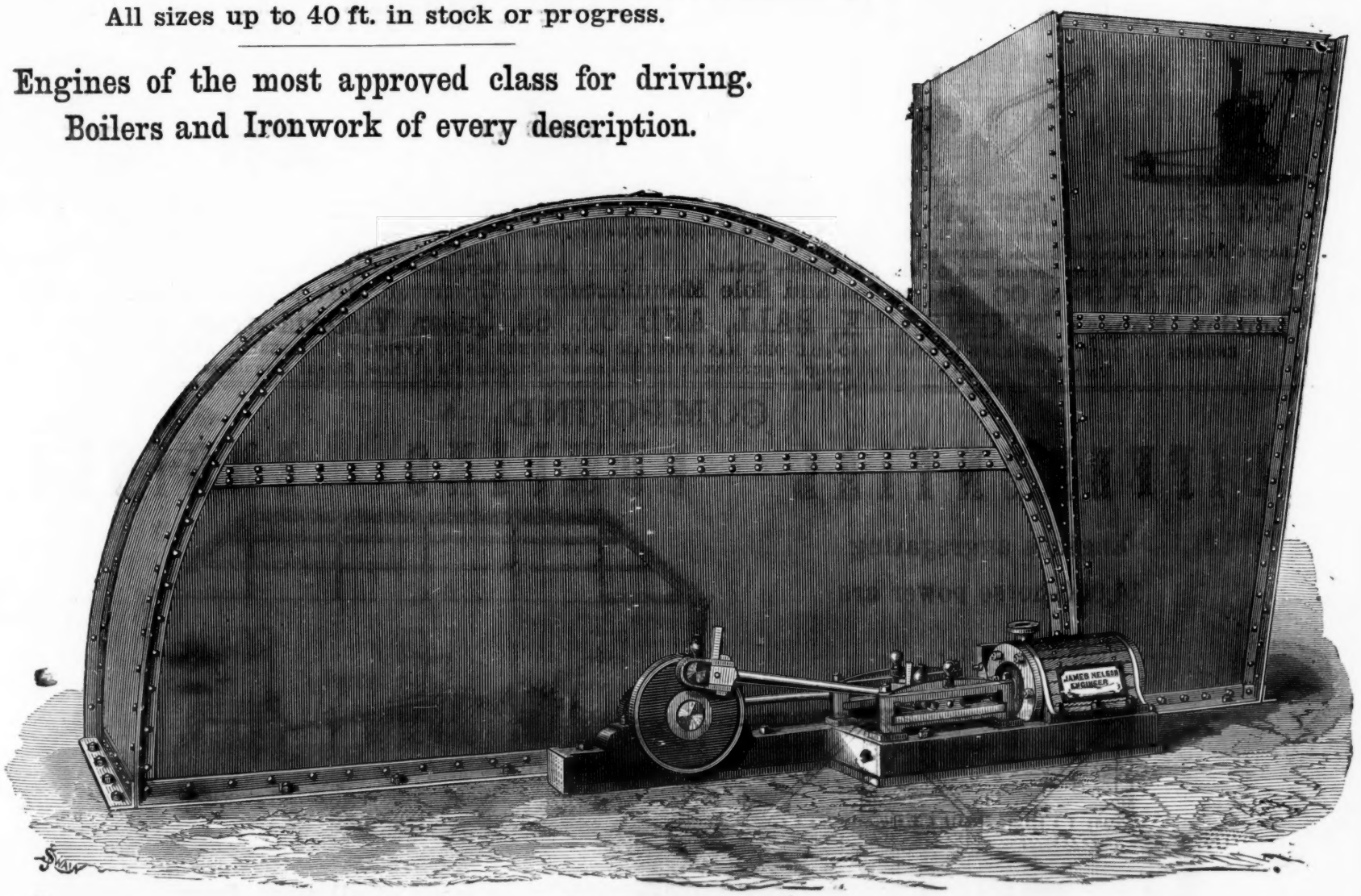

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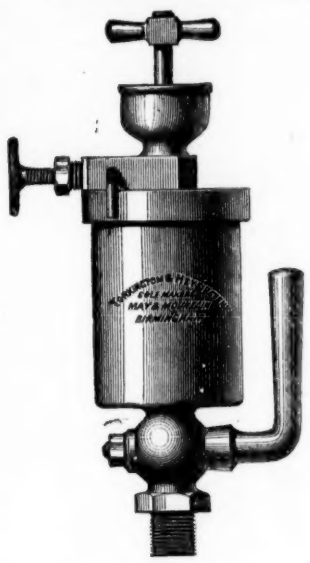

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0	1½ }	Engines... }	10 6
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3	3	10 20	27 6
4	3½	20 30	37 6
5	4½	30 50	47 6
6	5	50 70	60 0
7	6	70 100	90 0
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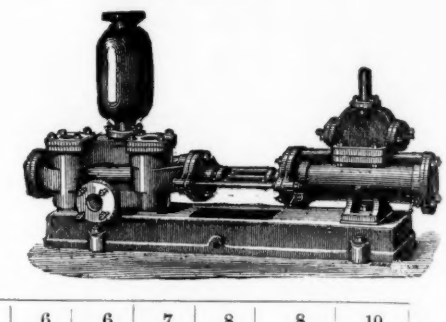

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Stroke	12	18	18	18	18	18	18	18	18
Gallons per hour.....	720	1260	5040	4280	9660	8700	7920	12,180	12,060
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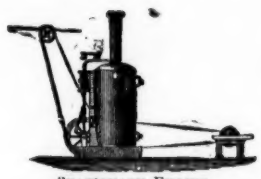

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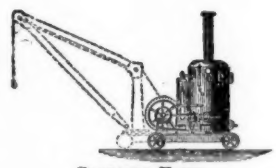

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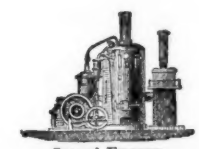

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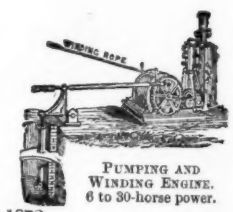


PUMPING AND WINDING ENGINE.
6 to 30-horse power.

* These cranes were selected by H.M. Commissioners to receive and send away the heavy machinery in the International Exhibitions 1862, 1871, and 1872.

Chaplin's Patent Improved Steam Excavator or "Navvy." Engines and Boilers for Light Screw and Paddle Steamers.

Steam and Hand Derrick and Overhead Travelling Cranes. Steam Cargo Barges, Steam Launches, and Yachts.

ALEX. CHAPLIN & CO., Patentees and Sole Manufacturers, Cranston Hill Engine Works, Glasgow.

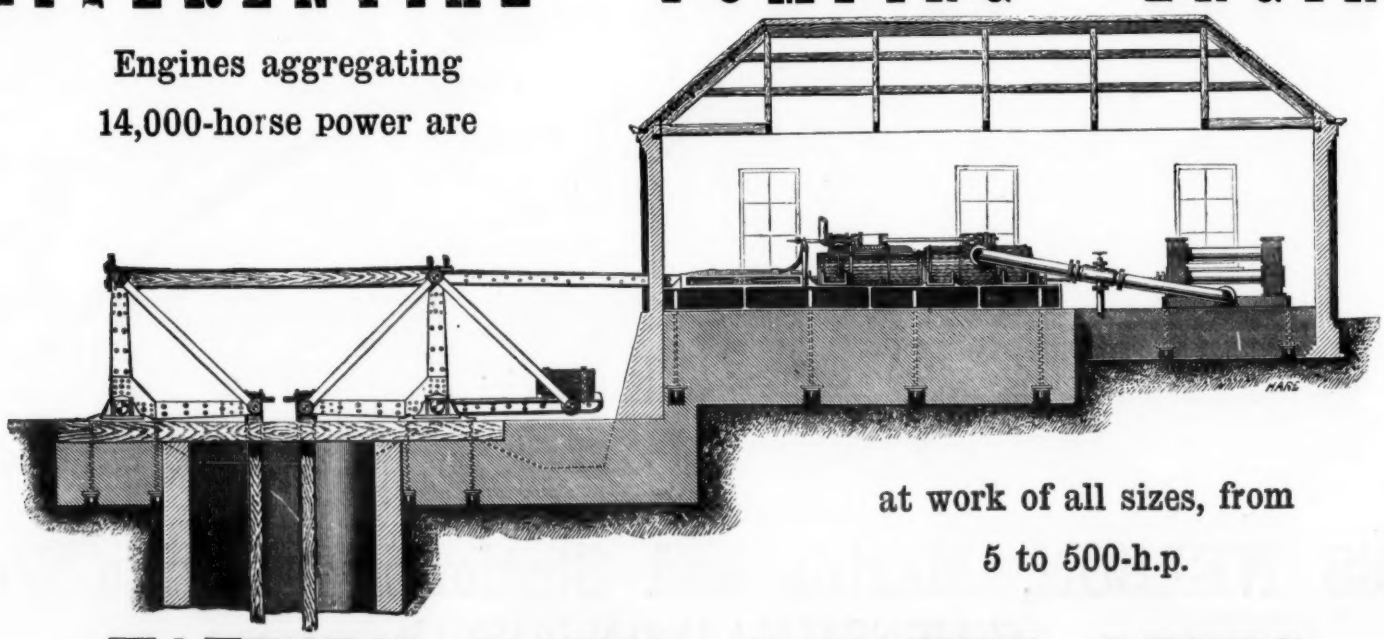
London House: M'KENDRICK, BALL, AND CO., 63, Queen Victoria-street, London, E.C.

ENGINES OF EACH CLASS KEPT IN STOCK AND ALL OUR MANUFACTURES GUARANTEED AS TO EFFICIENCY, MATERIAL, AND WORKMANSHIP.

Parties are cautioned against using or purchasing imitations or infringements of these Patent Manufactures.

COMPOUND DIFFERENTIAL PUMPING ENGINES.

Engines aggregating 14,000-horse power are



at work of all sizes, from 5 to 500-h.p.

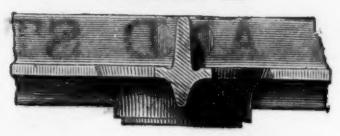
HATHORN, DAVIS, & DAVEY, LEEDS.

HARRIS'S PATENT WROUGHT-IRON WINDOWS.

DOME AND OTHER ROOF LIGHTS, FLOOR AND PAVEMENT LIGHTS, ETC.

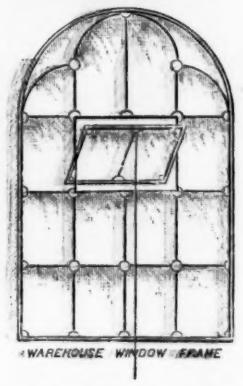
GREAT BRITAIN,
UNITED STATES OF AMERICA,

PATENTED IN



FRANCE,
GERMANY, AND BELGIUM.

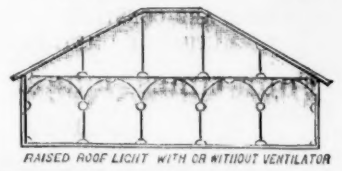
ARE STRONGER, SUPERIOR, AND CHEAPER THAN ANY OTHER METAL SASHES YET PRODUCED—COST LESS FOR GLAZING—ARE AS CHEAP IN MANY CASES AS WOOD

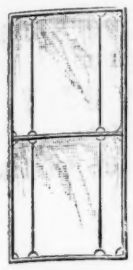


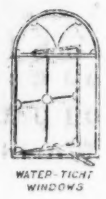
—CAN BE DESIGNED AND MANUFACTURED TO SUIT ANY STYLE OF ARCHITECTURE OR POSITION WHERE A WINDOW MAY BE REQUIRED.
ARE BEING EXTENSIVELY USED IN—

Private Houses,
Parsonage Houses,
Farm Houses,
Churches,
Chapels,
Schools,

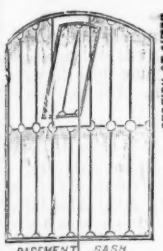
Lunatic Asylums, &c.,
Public Buildings, Banks,
Wharves, Warehouses,
Factories, Mills,
Breweries, &c.,
Engine Houses.



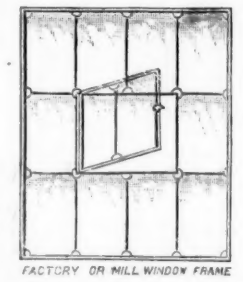




ILLUSTRATED CATALOGUES
ON APPLICATION.



In Basement Storeys and Exposed Positions Shutters and Guard Bars are dispensed with.



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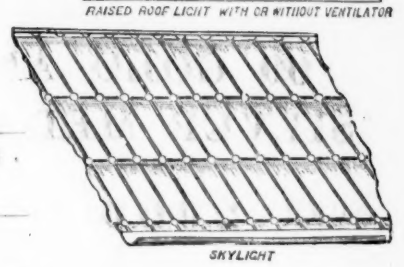
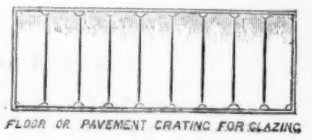


Security is obtained in these Skylights without Guard Bars, and with less obstruction to Light.



HOME AND EXPORT.

SOLE MAKER—**J. T. HARRIS**, Engineer, Ironfounder, and Manufacturer,
SAFE, STRONG ROOM, AND PARTY WALL DOORS, AND EVERY KIND OF CONSTRUCTIONAL AND BUILDERS' IRONWORK, LIFTS, HOISTS, ELECTRIC BELLS AND TELEGRAPHS, &c.
90, CANNON STREET, LONDON, E.C.; AND BEAUFORT IRONWORKS, BRISTOL.

BOLTS, NUTS, AND COACH SCREWS.

ARCHER AND HARPER,

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Manufacturers of all kinds of Shipbuilders', Engineers', Coach, Wagon, and Fish Bolts: Coach Screws; Railway Spikes and Brobs; Hot-pressed and Forged Nuts, Rivets, Washers, &c., &c.

SHIPBUILDERS' AND RAILWAY STORES' CONTRACTORS.

IMPORTANT.

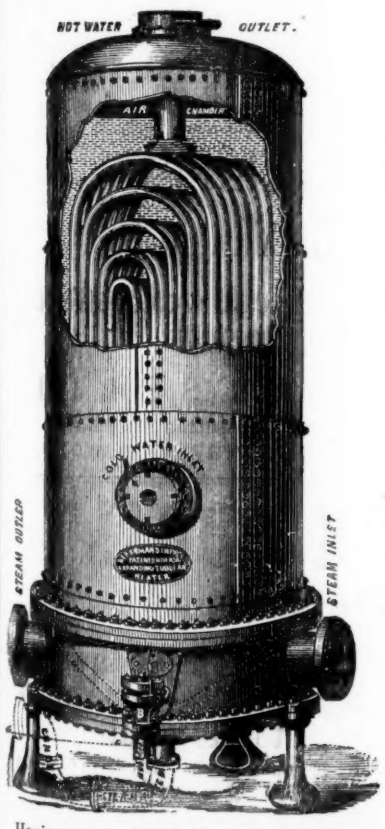
JOSEPH WRIGHT AND CO.

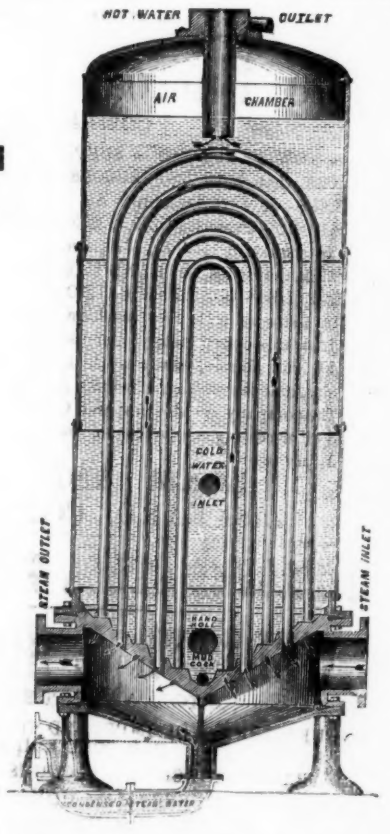
(LIMITED),

NEPTUNE FORGE ENGINE AND BOILER WORKS,

TIPTON, STAFFORDSHIRE,

AND AT 147, QUEEN VICTORIA STREET, LONDON, E.C.





Having purchased the Engineering Business lately carried on by R. BERRYMAN AND CO., at 23, Congreve-street, Birmingham, and 28, Wilson-street, Finsbury-square, London, have removed the whole to their Works at TIPTON, to which place ALL COMMUNICATIONS SHOULD IN FUTURE BE ADDRESSED, and where the BERRYMAN HEATER can be seen at work, and in every stage of manufacture.

Being the SOLE MAKERS and PATENTEES of these CELEBRATED COAL SAVERS and EXHAUST STEAM UTILISERS, and having remodelled and greatly improved them, adding largely to their HEATING SURFACE and WATER CAPACITY, J. W. and Co. have put down a special plant, which includes an entire new set of improved patterns, enabling them to offer these FEED WATER HEATERS to the public at

GREATLY REDUCED PRICES.

This arrangement of BRASS TUBES of a great length giving an enormous HEATING SURFACE makes this HEATER not only the MOST POWERFUL ever invented, but its FIRST COST PER FOOT OF HEATING SURFACE IS LESS THAN HALF THAT OF ANY OTHER. It will condense the whole of the Exhaust Steam from the Engine if required, and entirely does away with the NOISE and BACK PRESSURE from exhaust pipes.

ALL THE TUBES ARE OF SPECIALLY PREPARED SOLID DRAWN BRASS AND COPPER; both ends are expanded into the bored holes of the same Tube Plate, METAL TO METAL, and every tube is free to expand and contract independent of each other. Leakage is impossible, as, when the tubes are once fixed, nothing short of cutting out will remove them. No scurf adheres to the tubes because of the difference of expansion between SCURF and BRASS. The inside of the Heater can be washed out by means of the mud cock and hand hole whilst at work.

Only one pump or injector is required, and as the Heater is placed between the pump and the boiler, the water is forced, COLD, into it, and passes out at the top HOT into the boiler direct. Where the WATER WORKS PRESSURE is sufficient no pump or injector is needed.

The water being heated to BOILING POINT UNDER PRESSURE in the Heater, a saving of from 20 per cent. to 25 per cent. in fuel is effected; the disastrous results of grease in boilers are also avoided, the sewage and other loose matter in the water being deposited in the Heater, the acids are liberated there instead of in the boiler.

Every part can be lined with BRASS, COPPER, or LEAD, as may be required in special cases for heating water or any kind of liquor in large quantities for CHEMICAL WORKS, BATHS, WASH-HOUSES, AQUARIA, GREENHOUSES, BREWERIES, WOOL WASHING, DYE WORKS, TANNERIES, &c., &c.; they will also HEAT AIR FOR CUPOLAS AND BLAST FURNACES, and are now at work as INTERHEATERS for compound engines with direct steam from the boiler with a further saving of 15 per cent.

The New Price List, with detail information, is now ready, and will be sent on application, together with an Illustrated Catalogue, with references and testimonials from Firms using FOUR HUNDRED AND THIRTY-THREE of these Heaters.

H. R. M. will exhibit in full operation at the Royal Agricultural Society of Ireland Show, at Dublin, August 6th to 9th, one of his New Patent Stonebreakers, with screening apparatus, and on wheels to travel; also fitted with his new patent toggle bearing and drawback motions, and reversible planed back cubing jaws in sections.

H. R. MARSDEN, PATENTEE AND ONLY MAKER OF THE WELL-KNOWN BLAKE MACHINES,

ORE CRUSHERS AND STONE BREAKERS,

WITH THE

New Patent Reversible

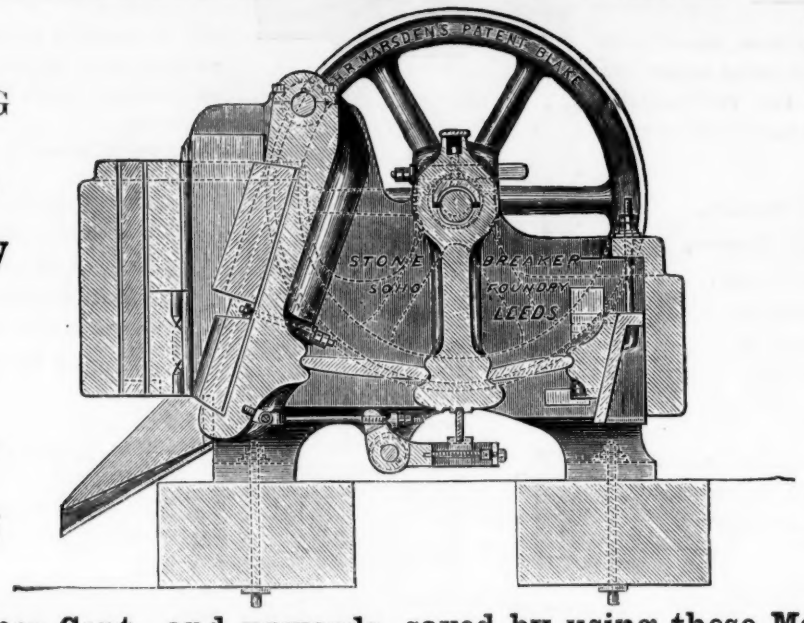
CRUSHING OR CUBING JAWS,

WHICH ARE CONSTRUCTED OF A PECULIAR MIXTURE OF METAL, WEARING

Four times longer than any other.

60 GOLD AND SILVER MEDALS.

OVER **2000** NOW IN USE.



For Crushing to any degree of Fineness, or Breaking to a required size.

Her Majesty's Government

USE THESE MACHINES

EXCLUSIVELY,

ALSO ALL THE GREAT

Mining Companies of the World.

H. R. M. has long observed the want of cheaper machines,

STONE AND ORE CRUSHERS,

And has at length, by means of improved appliances for the production thereof, been enabled to reduce the prices, yet keep up at the same time the well-known strength of construction. Reduced prices on application.

FIFTY per Cent., and upwards, saved by using these Machines.

TESTIMONIAL FROM MESSRS. JOHN TAYLOR AND SONS.

6, Queen-street-place, May 10, 1877.

DEAR SIR,—We have adopted your Stone Breakers at many of the mines under our management, and are pleased to be able to state that they have in all cases given the greatest satisfaction. We are, yours faithfully, JOHN TAYLOR AND SONS.

H. R. Marsden, Esq.

Royal Agricultural Show, Liverpool, July, 1877.

DEAR SIR,—I have broken over 40,000 tons of very hard LIMESTONE into ROAD METAL, for the Newport and other Road Trusts, in your PATENT STONE BREAKER, AND ALL WITH ONE PAIR OF JAWS, which are STILL IN USE. I do not think at all, but am quite sure yours are the only Machines which fully perform the work you set them out to do, and there are none in the Show can at all compare with them. Yours, truly,

H. R. Marsden, Esq. WILLIAM PRICE, Contractor, Gold Cliff, Monmouth.

INTENDING BUYERS ARE CAUTIONED AGAINST PURCHASING OR USING ANY INFRINGEMENT OF THE NUMEROUS PATENTS OF H. R. MARSDEN.

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TO COLLIERY AND MINE OWNERS.

R. HUDSON'S PATENT STEEL CORVES OR "TRAMS."

Patented July, 1875, and January, 1877.

Entire new principle, saving three-quarters to 2 cwts. "dead" weight per corve. Will hold 2 to 3 cwts. more coal than the ordinary kind, *without increasing the outside dimensions.* Adopted by—

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Messrs. CLAYTON and SPEIGHT, Farnley, near Leeds.
Messrs. JAS. WORMALD and SONS, Rawdon, near Leeds.
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Messrs. KIMBERLEY, Diamond Mines, South Africa.
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WEST YORKSHIRE IRON AND COAL Co. (Limited), Tingley, near Leeds.
WM. BAIRD and SON, Coatbridge, near Glasgow.
BETTISFIELD COLLIERY COMPANY, Bagillt, Wales.
EDFORD COLLIERY COMPANY, near Bath.
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COMPANY

Are NOW PREPARED to SUPPLY their DRILLS, the ONLY ONES that have been SUCCESSFULLY WORKED in the MINES of CORNWALL. At DOLCOATH MINE, in the HARDEST known ROCK, a SINGLE MACHINE has, since its introduction in July, 1876, driven MORE THAN THREE TIMES the SPEED of HAND LABOUR, and at TWENTY PER CENT. LESS COST PER FATHOM.

In ordinary ends two machines may be worked together, nd at a proportionately increased speed. They are strong, ght, and simple, easily worked, and adapted for ends and opes, and the sinking of winzes and shafts.

The company are also prepared to SUPPLY COMPRESSORS, nd all necessary appliances for working the said Drills.

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LOAM AND SON,

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IMPROVED STEEL WIRE FOR ROPES.

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MANUFACTURERS OF IMPROVED STEEL WIRE FOR ROPES FOR COLLIERIES,

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SOLE MANUFACTURERS of the HOMOGENEOUS WIRE for the ATLANTIC CABLES of 1865 and 1866.

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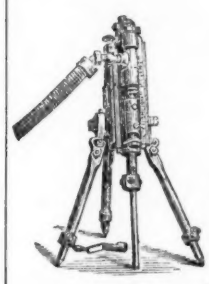
MINE AND QUARRY STANDS, STEEL DRILLS, SPECIALLY PREPARED INDIARUBBER HOSE, TESTED IRON PIPES, &c.



Air-Compressing Machinery,

Simple, strong, and giving most excellent results, and

ELECTRIC BLASTING APPARATUS.

Full particulars of rapid and economical work effected by this machinery, on application.

CONTRACTS TAKEN, OR SPECIAL TERMS FOR HIRE.

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THE ROANHEAD ROCK DRILL.

BY ROYAL LETTERS PATENT.

This justly-celebrated Rock Drill, the only one invented that will work in the hardest rock without more than the usual repairs required by any ordinary machinery, is now offered to the public.

It has been most successfully worked in the well-known Hematite Mines of Lancashire and Cumberland. Will drive 50 to 60 ft. in hard rock without change of drill, and can be worked by any miner, and kept in repair by any blacksmith. It is the most simple rock drill ever invented, and cannot with fair usage get out of order.

Plans, Estimates, including Compressors, and all other Mining Machinery, supplied on application to the sole makers,—

SALMON, BARNES, AND CO.,

MINING ENGINEERS.

Canal Head Foundry and Engineering Works, Ulverston.

J. WOOD ASTON AND CO., STOURBRIDGE

(WORKS AND OFFICES ADJOINING CRADLEY STATION),

Manufacturers of

CRANE, INCLINE, AND PIT CHAINS,

Also CHAIN CABLES, ANCHORS, and RIGGING CHAINS, IRON and STEEL SHOVELS, SPADES FORKS, ANVILS, VICES, SCYTHES, HAY and CHAFF KNIVES, PICKS, HAMMERS, NAILS, RAILWAY and MINING TOOLS, FRYING PANS, BOWLS, LADLES, &c., &c.

Crab Winches, Pulley and Snatch Blocks, Screw and Lifting Jacks, Ship Knees, Forgings, and Use Iron of all descriptions.

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